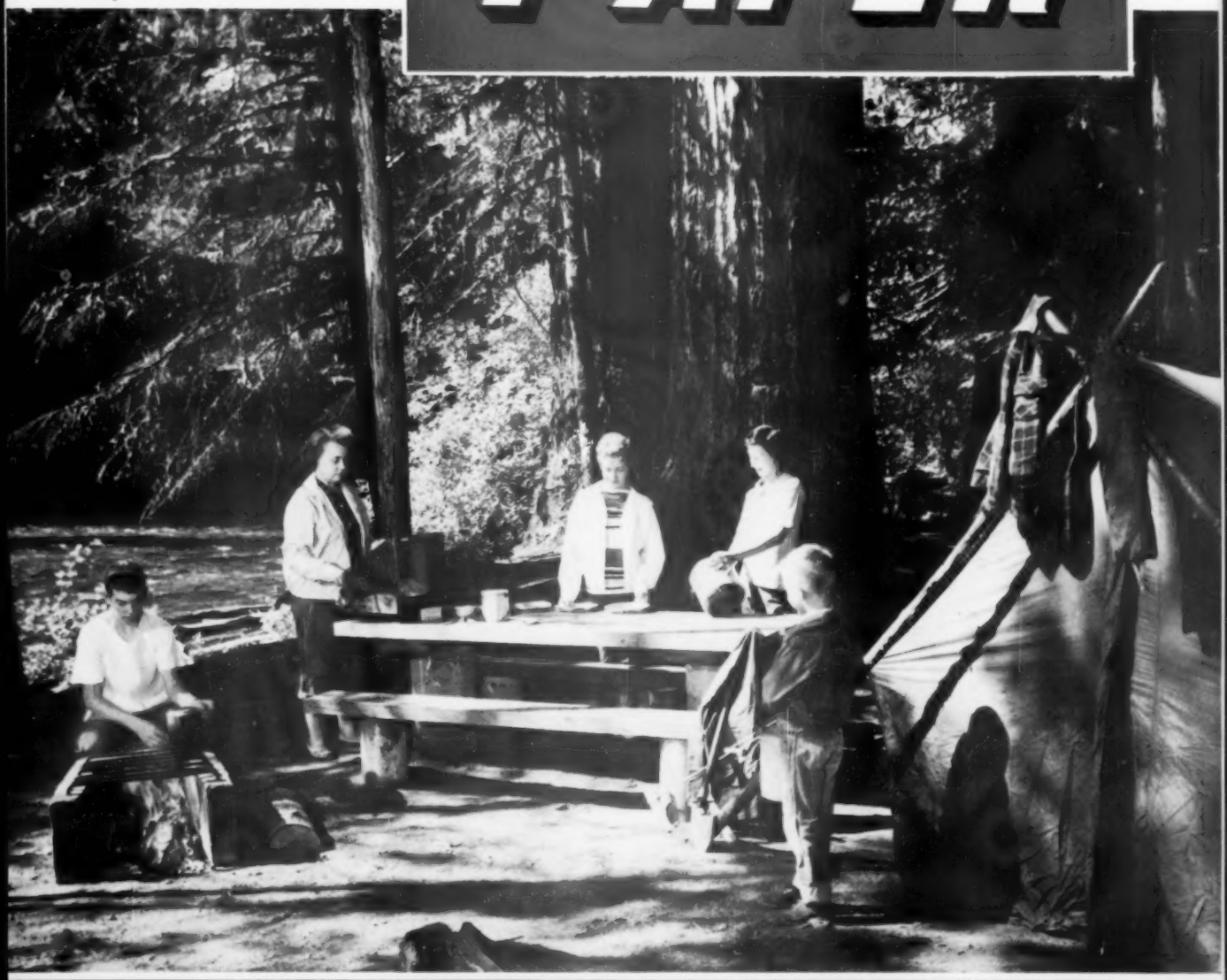
May 1, 1961

PULP & PAPER

Multiple Land Use...



1961 Pulpwood Annual

p. 41

SPECIAL: How JFK program affects paper industry

p. 3

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May 1, 1961 VOLUME 35, NUMBER 9

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COVER PICTURE: Increased pressures will be brought to bear for more multiple use areas such as this on private as well as public lands. (Photo courtesy U.S. Forest Service.)

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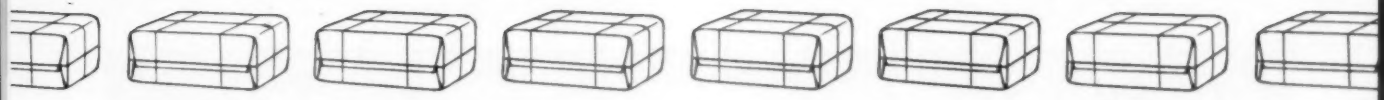

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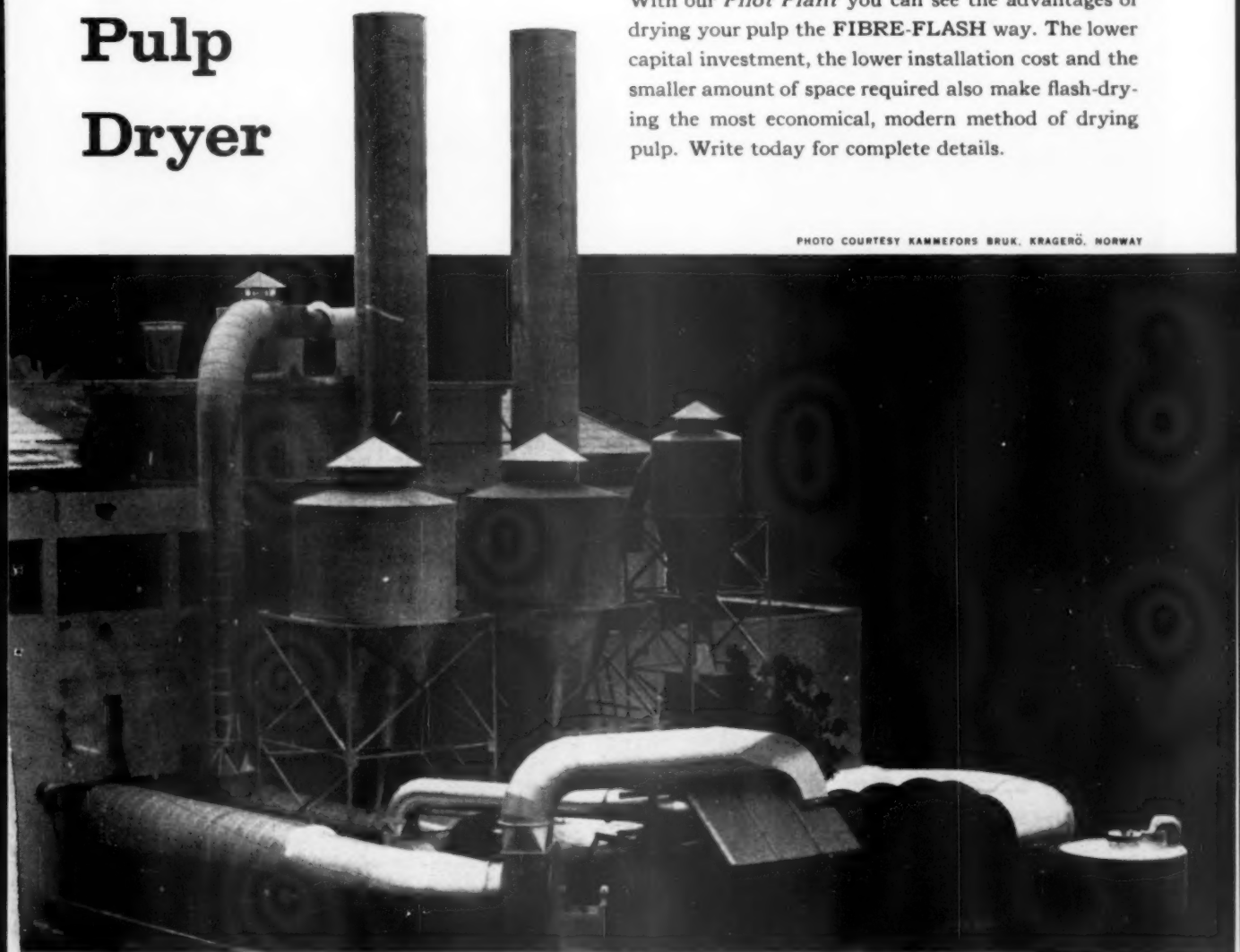

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NEWS DIGEST...

Price problems worry paper companies
even as an increasing flow of orders cheered them. The 5% to 7% reduction in multi-wall bag prices caused fears that the bag paper prices might also be affected.

A "disagreement in company policy"
was the reason M. J. (Joe) Foley gave for resigning as president of MacMillan, Bloedel & Powell River Co. Ltd., which became one of this industry's greatest mergers 16 months ago. For the time being other executives from the Powell River "side" were remaining. Mr. Foley said he would join an eastern Canadian forest products firm.

A big increase in German imports
of U.S.A. paperboard—a threefold jump from 1959 to 1960—is reported by the U.S. Dept. of Commerce. U.S.A. replaced Sweden as second highest exporter to West Germany of paperboard and kraft papers, except sack. Finland was first. This helped raise U.S. exports of paper and board to a record 902,000 tons (value $180 million) in 1960.

Outside chip storage has been introduced
at the Canada Paper Co., following successful experience of its Canadian affiliate, Howard Smith Paper Mills. Use of sawmill planing waste for pulp at Donnacona Paper Co. on increased scale is now made possible by new Bauer refining equipment.

600 billion gallons of water in 1980
is what the United States will need, according to Dr. Frank J. Welch, assistant secretary of agriculture. This is twice the consumption today. This conflicts sharply with contentions of champions of new federal water pollution bills who have claimed water requirements would be three or four times as great. Mr. Welch said 8,300 small watersheds in U.S., a major source of water yield, are below par in productivity and in need of corrective treatment. He also declared small private timberlands need watershed improvement and the Forest Service lands "needs a shot in the arm."

Kimberly-Clark acquires Century Envelope
New York. Frank J. Meyer, president of Century, will retire but continue as consultant.

PULP & PAPER on-the-spot report:

The Washington Scene

By WILLIAM F. DIEHL, JR., Staff Editor

Kennedy's first hundred days, how they affect paper industry

WASHINGTON—If President Kennedy's first hundred days in the White House have proved nothing else they have proved that few things here are certain these days. The one thing that is certain is that the status does not remain quo. The pace established by the new administration is frantic. Political winds can shift overnight.

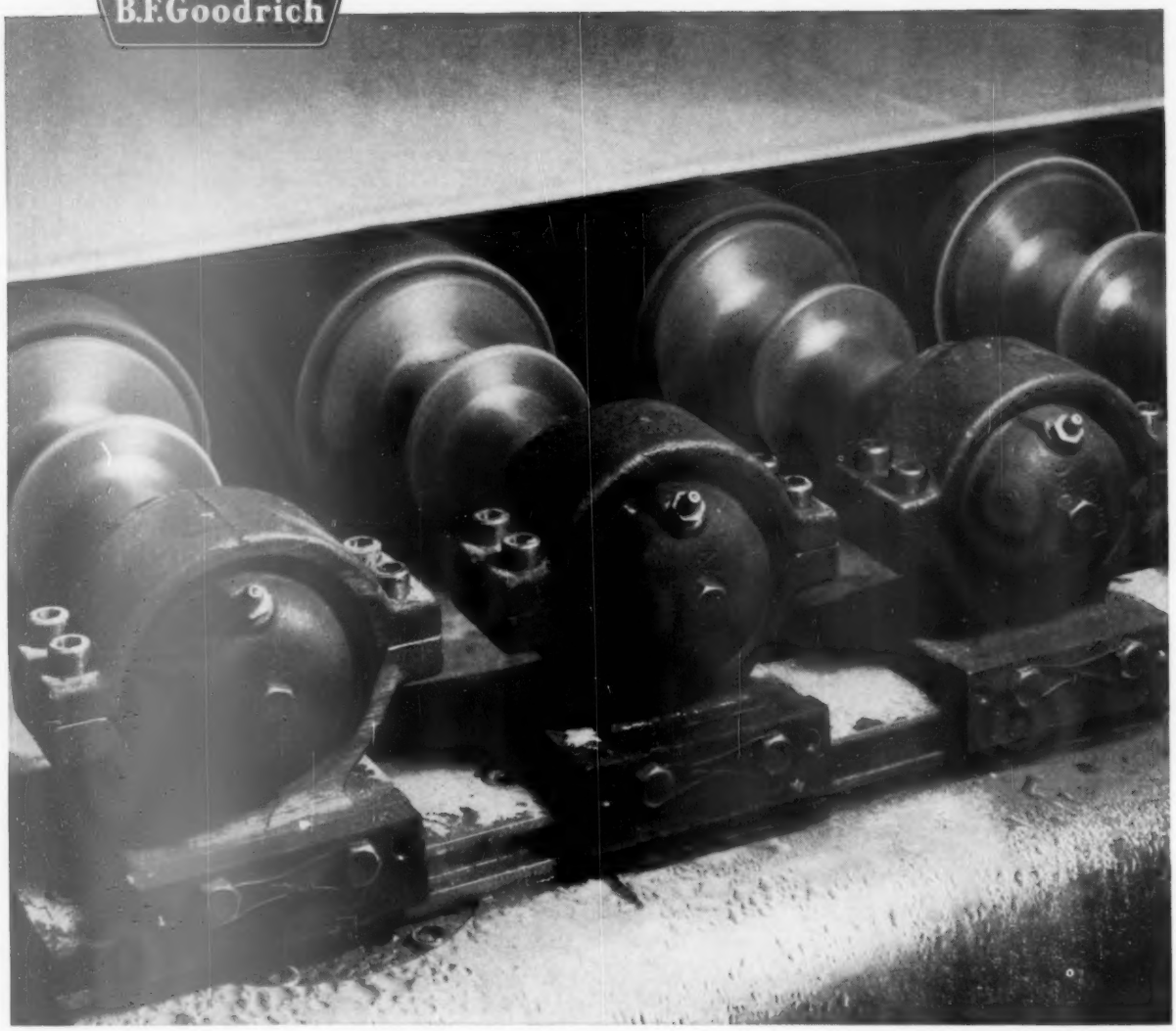
A veteran newsman in Washington puts it: "There is a kind of electrifying fascination about this administration. Sometimes you get the feeling Kennedy would rather move ahead on a project and lose his case in Congress than sit around waiting for the climate to blow right. His approach is almost blatantly positive."

To date, this has caused a certain consternation on the part of industry representatives here, particularly where natural resources are concerned. The Wilderness Bill introduced by Senator Anderson is a major concern. So is the administration's approach to waterways and pollution problems.

President Kennedy has established a full-speed-ahead pace. Asked if this was just a fast break from the gate and might slow down as time goes on, one government department head told PULP & PAPER: "It will never slow down. We are working for a group of young men who want to get things done. Sit-and-wait isn't the game . . ."

Major industry interest is focused on: What will happen with the Wilderness Bill; what are the particulars of the new Farm Bill; how is this administration planning to deal with the small landowners; where do private interests stand in the "New Frontier."

B.F.Goodrich



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Photographs at Presidential press conference by staff editor W. F. Diehl, Jr.

...WASHINGTON SCENE

The Wilderness Bill: Stakes

are high in this controversy over single versus multiple use

A CASE IN POINT is the Wilderness Bill. Sen. Anderson's controversial legislation in its original form was not even acceptable to all government agencies. But it has now been amended to a point where most observers feel the President, as this was written, wanted it to go before Congress as it stands. How will it fare? Leaders in both the agriculture and interior departments seem to feel the same. They say it will pass the Senate, has perhaps a 50-50 chance in the House.

Typical of the type of opposition the bill has run into can be seen in the National Association of Soil Conservation Districts' recommended revisions to the original bill. They suggested that: (1) Additions to wilderness system be authorized only as a result of affirmative action by Congress; (2) Complete resource inventory be made to all prospective wilderness areas as a preliminary for congressional consideration; (3) Affirmative language be included for the control of fire, insect and diseases in these areas; (4) Manipulation of high watershed forest cover, reservoirs, water conservation and water production measures be authorized under certain circumstances. Under its present form the bill is now acceptable to the NASCD.

Balance of power in deciding this bill, while in committee, probably was resting with four Democratic Senators, Bible of Nevada, Moss of Utah, Church of Idaho and Carroll of Colorado, and Republican Senator Fong of Hawaii.

Main criticism from industry is that the bill could result in wholesale sequesters of land into one-purpose wilderness area and out of multiple-purpose use (on which timber rights are now available.) Active groups such as the American Pulpwood Assn. have constantly hammered away at the dangers of single-purpose, warning that the Anderson bill could be a giant step in this direction.

A top man in the Department of Interior, however, takes exception to this viewpoint. "The administration is committed to multiple use," he told PULP & PAPER, "especially in the field of recreation. The industry's concern over marketable timber in wilderness areas is somewhat unrealistic. There has never been a good inventory made of the national forests to determine how much merchantable timber is available. Most of it is either inaccessible or in places where it is uneconomical to get out."

Recreation may be industry's biggest worry-wart, not wilderness sequesters. It is no secret that Mr. Kennedy is devoted to the cause of recreation. In the Department of Agriculture, one department head commented: "Timber-using industries should begin looking at this question of recreational use of their lands. You can look for strong recommendations along these lines from the Rockefeller Commission (ORRRC). Look for it to come out with far-reaching recommendations dealing with recreation on private lands. Before very long, large forest owners are going to be put under heavy pressures to open up more of their lands for public use. If the industry begins taking positive steps in this direction NOW it can avert some of these pressures. . ."

A Department of Interior spokesman added similar comments: "This administration is committed to a multiple purpose position. But recreation is going to take the lead. There is no legislation at this stage of the game that will make ANY difference in the multiple purpose philosophy. But government leaders do not foresee any conflict with industry on the use of forests for timber, water, grazing and wildlife. After all, people without jobs can't enjoy the recreational facilities. We must think in terms of combination use. If large areas are taken in for recreation, let's say, one solution could be that strategic commodity areas on these lands could be left open for forest products industries."

Increased recreation pressures are very likely to come from the public, too. More people went to National Forests, in 1960, for instance, than ever before. Visits, according to Agriculture Secretary Freeman, totalled more than 92⅛ million—13.5% over the 1959 figure. Other recreation visits, he said, showed an increase of 10 to 15%.

(The pulp and paper and other forest industries likewise have opened many of their lands for recreation, building many special facilities for the public. Their recreation areas have multiplied many times in the past decade.)

Noting that the Forest Service last year built 3,000 new family camp and picnic units under its Operation Outdoors Program, Secretary Freeman indicated that "additional sites are needed and will be developed under a broad program to develop facilities which encourage balanced use of forestry resources.

Industry spokesmen, however, still stand firmly in favor of postponing action on the Wilderness Bill until after the Rockefeller Commission submits its report on the grounds that it is a step away from multiple use and the commission report could strengthen the multiple use position. The Society of American Foresters' Puget Sound Section, whose 600 mem-

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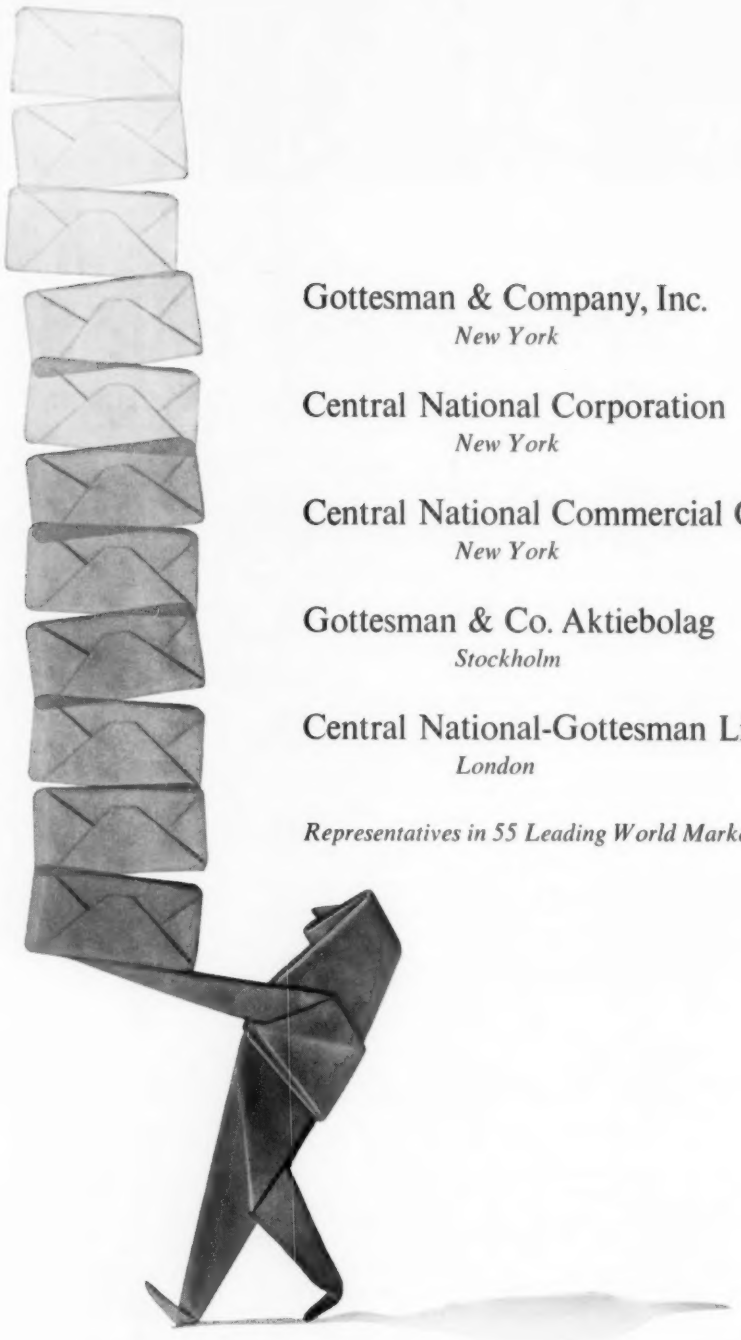

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bers include federal, state, consulting and private professional foresters, testified before the Anderson Committee that its membership "strongly opposes any attempt to establish wilderness areas by blanket legislative action without exhaustive study of individual areas and their inter-relationship with other hands in an affected administrative units."

If the Kennedy administration is solidly behind the multiple use philosophy, the big question seems to be just how far apart government and industry are in these matters? ■

The Small Landowner: Interest

in his future could result in accelerated federal programs for him

WASHINGTON—Increased attention is going to be focussed by the government on the small landowner whose holdings, less than 5,000 acres apiece, total some 265 million acres—74% of the private forest land and 54% of all commercial forests.

A well-informed Washington source told PULP & PAPER "Something startling concerning the small landowner is in the wind . . . it's coming soon . . . it's been building for months . . ."

What that "something startling" will be is conjecture. But it is a fairly safe guess that it will take the form of some kind of newly enlarged government program.

Industry leaders, aware of this, are watching the situation closely. It is their feeling that any kind of program will bear hard scrutiny, that perhaps even the assumptions upon which such a program would be based might bear attention.

Industry, particularly in the South, has levelled a great deal of attention at the small landowner in the past few years, encouraging them to realize his growth possibilities. Basically, this attention has taken the form of literature, special newspapers aimed at helping tree farmers, the Tree Farm program itself, personal contacts, programs like the AFPI's Busy Acres and SPCA's Pilot Forests. But the small landowner is hard to get to, sometimes even harder to find.

Has the real problem been touched upon? The question has been raised by at least one government source that "contrary to previous assumptions, non-resident owners and farmers don't really want to assume active roles in the management of their lands."

Said he: "Many hold them simply for recreation or for purposes other than forestry. The big problem might well be how to stimulate this broad group to accept forestry practices and cultivate lands for timber. . ."

Part of this intensified interest in the small landowner might well be traced back to the controversial Barrett Paper, presented before the Association of Consulting Foresters last fall by Leonard I. Barrett, retired Forest Service department head. Barrett suggested a sweeping program of aid to the small woodland owner including 12 specific aids that embodied education, subsidies to spur interest, marketing aids. The controversy arose over how much of the Barrett Paper was Leonard Barrett's thinking and how much reflected ideas of the entire forest service. Forest Service head McArdle while pointing out that the paper was drafted by Barrett has not disavowed many of the philosophies projected in the paper.

There are some in government circles who feel that the Barrett Paper did not go far enough, that it needed to be projected farther.

The Resources for the Future (Ford Foundation) program for small woodlands is being studied carefully by government forestry agencies. It embodies a philosophy and many ideas which might well be the basis for Kennedy legislation later in this session of Congress. The role the federal government would play is clearly indicated in this study, prepared in large part by Charles H. Stoddard, head of the Dept. of Interior's Technical Review Section.

In his summary of the Study on Small Private Land Ownerships Programs and Problems in the U.S., there are several conclusions and suggestions for further action. Says this report: "A major conclusion . . . makes it quite evident . . . that simply expanding present programs designed to assist forest landowners will not of themselves solve the demonstrated deficiencies and are not likely to bring about substantial improvements in forest management.

"Reorientation and redirection of the public forestry effort plus private supplementation emerge as the critical elements to be satisfied in gaining this objective . . ."

Four suggestions are offered:

1. The summary recognizes progress made in educational and technical assistance programs, suggests possible reduction of service duplication to "reduce confusion on the part of landowners over . . . programs designed to assist them." The summary suggests as a practical media local soil conservation districts, advises against a new body. "Forestry agency assistance programs," says the summary, "would be given priority with those landowners who have signed cooperating agreements to maintain conservation practices, recommended in plans (in order to justify public expenditures and maintain continuity of management.)" Summary also suggests that Soil Districts serve as central file for records for forest management plans and operations records but ad-

Fluid Power news

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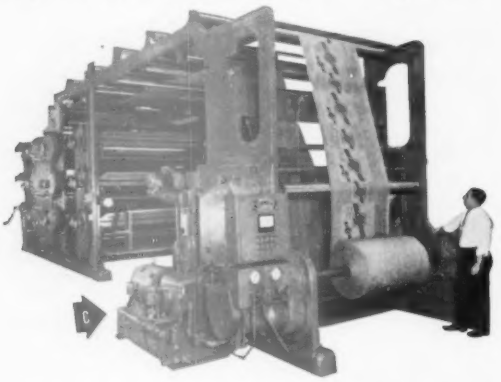
Report No. 12,301 — From Oilgear *Application-Engineering* Files

HOW OILGEAR *Any-Speed* DRIVE SYSTEMS ON *SCHMUTZ* 6-COLOR PRINTING PRESSES HELP BOOST PERFORMANCE, EFFICIENCY, ECONOMY, CONVENIENCE — IN LESS SPACE

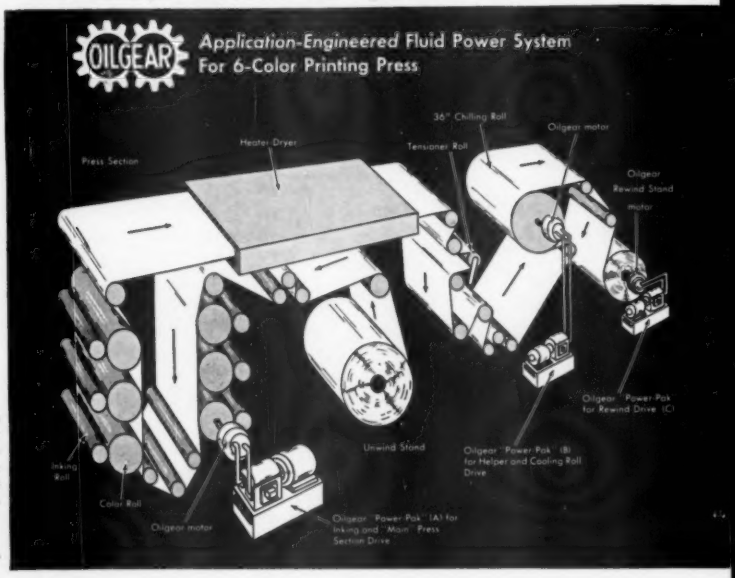
CUSTOMER: *Schmutz Manufacturing Company, Louisville, Kentucky.*

PROBLEM: Main and rewind drives with control systems for web-fed, 6-color printing presses for printing packaging stock — from 50 or 60-lb kraft, to container and food board. Web widths vary from 40"to 84", with impression "repeat" varying from 14" to 84".

REQUIREMENTS: 1. Constant or absolute tension on the press section to provide "dot-to-dot" register over an infinitely variable (stepless) speed range from 0 to 1000 feet per minute . . . and hold set speed and tension without variation regardless of fluctuations in load, electrical power input, or temperature. 2. Provide either constant or tapering tension for rewind — from 4" cores to 40" or 60" dia. rolls. 3. Must be economical from the standpoints of installed cost — operation and maintenance — floor space — and electrical power input. 4. Clean, quiet operation — with minimum heat dissipation. 5. To be "packaged" or pre-assembled for simplicity and speed of installation. 6. Eliminate, if possible, the long lineshaft drive that "closed up" one side of the press. 7. Be capable of dependable, trouble-free, continuous, 'round-the-clock operation.



ABOVE: Rewind end of an Oilgear-equipped, 84" Schmutz High Speed Press — with 84" maximum impression repeat, speed range from 0 to 1000 fpm — with constant acceleration and deceleration rates. Oilgear Rewind Drive, indicated, can hold in stalled condition indefinitely — follow press speeds and rewind from a 4" core to 60" roll. The variable, constant or drooping tension characteristics with absolute constant or decreasing tension — without any steps whatsoever — enable this Oilgear-powered 6-color press to hold register closer than previously experienced.



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vises that in areas where forestry in only one of several land uses "the establishment of special districts would be less wise than using existing Soil Conservation Districts."

2. Summary advises Forest Management service associations as practical means for bringing variety of supervised operating, production and eventually marketing services needed for non-operating forest landowners. These could also "logically be expected to manage and regulate hunting, fishing and other recreational uses for income to owners . . ."

These would be informal groups to start with "but may be formalized into non-profit associations or corporations, co-operatives or other organizational structures if circumstances warrant." It is suggested that large numbers of consulting foresters be used for managerial tasks. The report states that an extensive review of European forest management groups shows that primary difficulty occurs in promotional stages where "several years of work and sufficient initial funds are needed to get them on sustained basis."

Says the report: "Underwriting of development costs through subsidy or loans would appear to be a necessary means of establishing forest management service associations . . ."

4. Report states that there is a dearth of adequate forestry data upon which to make further analysis in the economics of private forestry. "Not only do we lack many of the statistical measures available in agriculture and other types of enterprise but only a beginning has been made in the field of marketing and costs and returns from the operation of small forest businesses (comparable to farm management accounting) . . ."

5. Concludes the report: "Whether an accelerated program should be undertaken to assure production from small forests to meet forecasted increases in timber requirements is a legislative decision which this study does not assume as a premise. Should such a decision be made, it is strongly recommended that the first three suggestions . . . be made the basis for accelerated programs rather than multiplication of those currently in effect."

The survey suggests "pilot plant" associations located in a half dozen or more widely dispersed areas in which initial costs could be underwritten and closely followed with research studies to determine its results.

Industry reaction to this report will, of course, be forthcoming. One industry leader, however, capsuled his reaction to such a program this way: "There's no doubt about it, industry must become more active in this small landowner area. We've been doing a great deal and we're fully aware of the problems, including apathy on the part of the landowner in frequent cases. But if we get more active on the local scene we can accomplish the same thing as a cooperative program . . . without its restrictions." ■

West Coast steps up water, air controls

New systems introduced, fisheries study has surprises

PORTLAND, ORE.—Water-air control measures have been of more than normal concern to West Coast legislatures this session. Bills introduced by Washington's legislators would have reconstituted the state control commission, and would have levied use fees on effluent. Both died in committee. Modifications of the state's air pollution regulations changed the number of members on the control board from 7 to 9. The state director of health is an ex officio member; industry will have two members.

Oregon's air-water control legislation was subject to much up-dating study in sessions which are expected to terminate soon after this report goes to press. It appears likely the resultant legislation will provide the state sanitary authority more power. One much-amended bill will apparently allow the commission to specify to cities and industry what must be done but not how it shall be done. Impetus for legislative action was provided by a river pollution situation created by the state's largest city.

As to establishing new mills along California's inland rivers (such as Sacramento, San Joaquin), high effluent demands have been specified. Some industry observers feel the resultant costs from meeting specifications will be exceedingly high.

A flotation fiber recovery system at West Tacoma Newsprint Co., a 200 tpd. newsprint mill at Steilacoom, Wash., was recently added. It is a 2,000 gpm. PIE system. According to Vice Pres.-Gen. Mgr. Neil F. Robertson, this "over $100,000" installation was made to further improve conditions in the receiving waters. This stainless steel-tile unit is adequate for double the capacity of the present mill. It recovers low-grade, suspended combustible solids.

Rayonier Inc. is building a 500 tpd. recovery plant preparatory to converting its Hoquiam, Wash. sulfite mill to soda base. The recovery plant will be completed about the end of this year.

Increased by-products production from plant wastes is reducing disposal problems while contributing to the forest economy. Firms prominently represented in this sort of recovery include Puget Sound Pulp & Timber Co., Crown Zellerbach Corp., Weyerhaeuser Co., Rayonier Inc. At least two other Western firms are concerned with feasibility of recovering natural wood resins and tall oil as pulp by-products. One is installing equipment, the other investigating.

The pulp-paper mills along Oregon's Willamette River and its tributaries have of recent years utilized special facilities in meeting stream improvement qualifications. Most of these plants lagoon their concentrate spent liquor, holding it for release only during high-flow periods. Some sulfite mills were converted from calcium to ammonia base to reduce effluent load and expand recoveries. One sulfite-groundwood mill unable to lagoon wastes because of physical-geographical conditions hauls concentrate liquor by barge-mounted tanks down the slow-flowing Willamette for subsequent release into the main channel of the Columbia.

These several Willamette mills meet, and in most cases considerably exceed, standards established by the state for this stream into which untreated and partially treated municipal sewage discharges in huge volume. The big municipal sewage problem motivated the current water legislative concern in Oregon.

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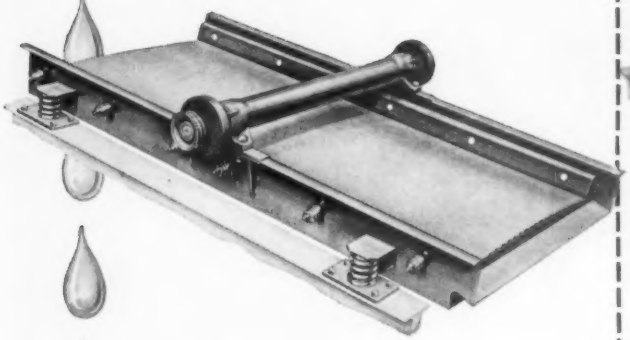

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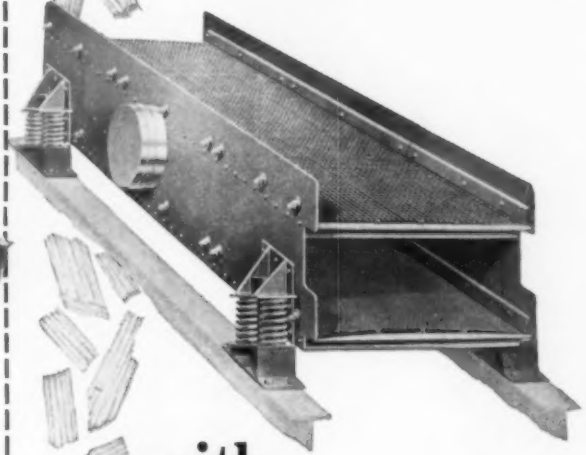
This simple, two-bearing design, combined with overall rugged construction, gives "NRM" vibrating screens long-lasting reliability . . . holds down maintenance costs.

BOOK 2777 contains complete information on Link-Belt "NRM" liquid vibrating screens and single, double, and triple-deck "CA" screens. For your copy, contact your nearest Link-Belt office.

"Shake down" your chip sizing costs



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B-744

. . . . . POLLUTION

A comprehensive fisheries study prepared for Northwest Pulp & Paper Assn. provides a revealing correlation between fish population and industry growth. These West Coast findings of consulting biologists, as reported in a 181-page summary, provide little support to the oyster peoples' contention the pulp industry is depleting the population of this shellfish.

Excepting but one year, annual landings of oysters on Pacific Coast (Calif., Ore., Wash., Brit. Columbia, Alaska) ranged from 515,000 lbs. to 807,000 lbs. during the 1920s. The exception was in 1924 when 1,229,000 lbs. were landed. Average landings during the next decade were 5.77 million lbs. per year. The ensuing 10 yr. period (1941-50) averaged 10.47 million lbs. annually. From 1951 through 1957, the yearly average was 11.0 million pounds.

During the same period Pacific Coast woodpulp production climbed from 384,401 tons in 1921 to 5,518,363 tons in 1957, which is an increase of over 1,350 percent.

Air improvement developments include installations for deodorization of gases and retaining particulate matter. Practically every kraft mill has made progress along these lines. The recently completed expansion of Fibreboard Paper Products Corp's. San Joaquin mill at Antioch, Calif., incorporated facilities for oxidizing black liquor, collecting and burning noncondensible gases, an electrostatic precipitator and stack scrubbers. This is representative of extent to which air losses are prevented in major expansions and in new mill construction.

Western Kraft Corp., Albany, Ore., on top of a series of air improvement projects already carried out, installed a new type oxidation tower last fall. According to C. R. Duffie, vice pres.-gen. mgr., it was selected because it appeared to provide "good oxidation efficiency."

Crown Zellerbach's slime-control program at Camas, Wash. has operated successfully since going into service seven months ago. This involves a $750,000 installation built by Crown Z to control slime growth in the Columbia River.

An elaborate collection system gathers chemical pulping leftovers which are pumped through a stainless pipeline to a 56-acre special-built lagoon located on a CZ-owned island. Following dilution and settling, the lagooned effluent is released at carefully scheduled intervals through a deep-water line in main channel of this large, fast-flowing river.

This is a "planned starvation program" for controlling a slime-causing organism (sphaerotilus) which feeds on sugars in pulping residues.

It was developed through several years of intensive river study and laboratory research carried on by Crown Z in cooperation with the state pollution control commission. ■

. . . . . OVERSEAS

Back United Europe, British paper men told

LONDON—The paper industry of the United Kingdom, despite its fears of Scandinavian and other competitors, has been called upon by the head of all British industries to help in creating an economically "united Europe."

Sir William McFadzean, president of the Federation of British Industries, made his appeal as guest speaker at the recent annual dinner here of The British Paper & Board Makers' Association. It came as there were increasing government pressures to bring about the widely predicted wedding of the two opposing European trade blocs—the European Economic Community or Common Market (the Inner Six nations) and the European Free Trade Association (the Outer Seven, including Britain).

Sir William recognized the strong hostility of the British paper industry to stepped up tariff reductions.

"Happily, I think I am right in saying your industry's more extreme fears over EFTA seem, so far at least, to have been unfounded," he said. "Finland seems likely soon to conclude an association with the Seven, and there is likelihood of further competition for you from that quarter.

"The EFTA tariff reductions scheduled for next January will now take place six months earlier, and the whole question of further acceleration is to be examined. These again are developments I know to be unpalatable to you. . . .

"I hope we as a nation will work together on the European problem, difficult as it may be for certain industries. EFTA is proving to have far, far greater merits in itself than was even anticipated.

"But EFTA is no substitute for a United Europe," declared Sir William. "It is to the achievement of this great objective, that I suggest each and everyone of us must work with all goodwill." The British Industries president said the "most dynamic changes anywhere are taking place on our doorstep—the Continent of Europe."

Paper industry—a problem child was the frank admission of John Langley, re-elected president of the British Paper & Board Makers Assn., in responding to Sir William. But nevertheless, Mr. Langley said that it could not "go along" with the majority of the Industries Federation on some of these economic matters.

Mr. Langley expressed "severe disappointment in the Geneva decision to speed up the timetable of tariff reductions," and said the industry hoped for the previously planned ten year period to adjust to tariff changes. As for Scandinavian competition, the test, he said, will be whether assurances of goodwill and interest in stability stand in bad as well as good times.

"The sound of tooth-sucking throughout the industry was deafening after the Prime Minister's famous 'exporting is fun' speech," said the paper group's president. But he did concede that exports were "the core of the economic problem." Leaving out the "distorting factor of newsprint," he noted that British paper exports were up 12% in 1960, while production was up 11%.

The Research Association of the British Paper & Board Industry employs over 100 persons, of whom 38 are graduates, at its Kenley, England, headquarters, said Mr. Langley. It occupies 40,000 sq. ft. of working space, he said, and spends annually £115,000. It receives support of 98% of the industry's productive capacity.

This support is not enough, he said. "The challenge of Europe leaves no doubt as to the price of failure in the research field." Mr. Langley said the British paper industry is in need of better publicity—it "is not getting itself across—it has no public image." ■

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British paper problems may reduce pulp needs

WILLIAM R. M. WATSON, immediate past president of the British Paper & Board Makers Assn., and president of a Scottish paper company, told American audiences recently at New York's Paper Week convention, that British papermakers are not worrying about pulp supply, but do face some problems in regard to selling the paper they will make out of it.

The Common Market (Inner Six) moves to equalize its external tariffs and the EFTA (Outer Seven) actions lowering their internal tariffs are "creating separate problems for the British papermaker."

He noted a trend in Britain to conversion in the paper mills.

At the London meeting (above) he was elected deputy president of the British Association.

"I suppose we are the biggest single pulp importing nation in the world," he told the pulp men. "We made and sold about 4,000,000 tons of paper last year, mostly, of course, on the home market. Two-thirds, approximately, of that paper was made from imported woodpulp from Scandinavia, North America, and some from Russia. Because of our peculiar position, a big industry with virtually no indigenous raw material except a by-product—waste paper—we are extremely sensitive to price changes and also to the balance of pulp/paper production in the rest of the world. We have seen, during the post-war years, some very strange situations, such as pulp coming in at a higher price than the paper made from it in spite of a duty free importation of pulp and a tariff wall against paper! Luckily, this position was of short duration.

"The British market for pulp remains reasonably healthy. There remain to be considered two things: the result of the tremendous increase in capacity for pulp and paper now going ahead in Scandinavia and Canada, and the repercussions of the Common Market and Outer Seven tariff policies.

"As regards the first, there will be about 700,000 tons extra of chemical pulp for sale by the end of 1961, which should ensure adequate supplies to us papermakers, *provided we can sell our production.* There is, however, the other side of it; namely, the vast increase in paper capacity also proceeding in those countries, a capacity planned to continue growing over the next three years at a rate which I cannot see the world market absorbing at anything like the same rate.

"The Common Market aims to bring its *external* tariff barrier to a common level and has already started this process. The level is quite a high one against imported paper.

"The Outer Seven, of which the United Kingdom is a member, aim to abolish *internal* tariffs within ten years altogether, and they too have started. (Recent action was taken to speed this up.) This creates two separate problems for the British papermaker. First, the possible diversion of Scandinavian exported paper from the Common Market to the British market, as the tariff situation makes it the more remunerative of the two, and this, in a small way, seems to be already happening. Secondly, with the gradual elimination of the British tariff protection, the swamping of the British market by Scandinavian papers which, in certain specific lines, could undercut the cost of the British product.

"Should either of these eventualities reach serious proportions, then there will follow, after a hard battle I have no doubt, the possibility that there will be a shrinkage in British production with a consequential falling off of pulp demand. However, we do not believe that this will happen, although we are not blind to the possibilities. Three factors are in our favor: One is our strong home market with the possibility of integration into the conversion field, which is a noticeable trend in the British papermaking field at the present time. Another is our resources from waste paper, which are highly developed and which no other European country has on anything like the same scale. And, finally, we do not believe that it is in the interests of the Scandinavian pulp producers to allow our British paper industry to suffer any severe hardship if it can be avoided, for, within the foreseeable future, there is no likelihood that the papermakers in Scandinavia could fill the vacuum which would thus be created. ■

Reused fibers prove safe in food packaging

NEW YORK—Cooperation between the pulp and paper industry and the government is resulting in the utmost protection of the consuming public from possible contamination of food packed in containers manufactured with pulps containing reclaimed fibers. This observation, and others which point up industry's exhaustive program into research of food packaging materials, was made by Dr. Keith Max, Continental Can Co., Inc., at the latest Metropolitan District TAPPI meeting.

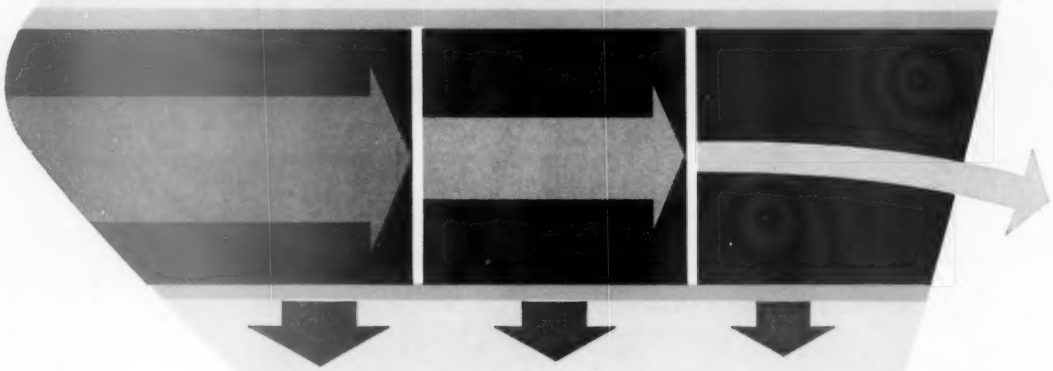
"Based on the studies of food containers to date," said Dr. Max, "the present outlook is very good. There is no reasonable expectation that there will be any contamination of foods in normal usage." Director, Research and Development, Containerboard and Kraft Paper Div. for Continental, Dr. Max has been working with industry committees and federal authorities for many years and is chairman of the Biological and Chemical Committee of the National Paperboard Assn. Highlights of his report follow:

According to the Food, Drug & Cosmetic Act (Williams Act), the food industry companies (and not the government, as formerly) carry the burden of proof that the additives in their products are not harmful. The paper industry, as a major supplier of food containers and with an obvious important stake in maintaining high standards of purity in packaging materials, has a number of research programs underway which are aimed at the elimination of any possible contamination of food by the myriad of substances which compose paper packaging.

The work of maintaining compliance with the Act has largely been carried out in the past by NPA's standing Biological and Chemical Research Committee and APPA's Chemical Ad-

From S. W. Hooper: a double effect design improvement in pulp screens

Cowan K-series centrifugal pulp screen operates at 100% increase in inlet consistency and a 66% decrease in fiber rejects.



In principle the new K-series screen, which in place of white water uses feed pulp as dilution in an elongated and narrowed cylinder, sharply increases the acceptance of pulp fiber for a given screen plate area.

By retaining the water-carried fiber longer within the cylinder, greater separation is accomplished.

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ditives Committee. Both groups decided that industry must do something on a combined operation for dealing with FDA, so five persons were formed into the "Food Additives Liaison Committee."

The Committee first surveyed the industry to find out what materials went into food packaging. Around 500 vital materials were chosen—mainly fibers but also sizes, waxes, resins, starch, et al. Many were proprietary materials and it was necessary to obtain information from the suppliers on what was in their products. In the latter respect, Dr. Max cited the helpful assistance of such groups as the Synthetic Organic Chemical Mfrs. Assn., the Corn Industry Research Foundation and numerous companies. Virtually no substance was found which is not "under consideration" by FDA, which, in other words, was not already being used with FDA's knowledge and permission.

The government felt that certain experimental and laboratory data would be helpful, even though it was generally thought that fiber was all right for food packaging. One area in which the committee had to work in was that of materials which had no status, for example, reclaimed fiber. (Today there are only two basic materials involved which do not as yet have some "status" with FDA.) Reclaimed fiber has undergone intensive research by NPA. On Feb. 4, 1960, industry filed with FDA documentation on reclaimed fiber and a definition was drafted.

After considerable investigation FDA found the practice of mills reusing paper to be satisfactory. FDA regards use of packaging made with reused fiber as appropriate if there is an impervious coating or a liner between the food and the container itself.

Where FDA was worried about heavy metals (from ink residues), the committee went to work and made an analysis of 82 different food-use boards. All heavy metals which were present were found to be insignificant except lead, which was "too high to forget about it." Haselton Laboratories of Falls Church, Va., did a series of tests of paperboard and analyzed extraction of lead and also mercury by the stimulated solvent procedure. They put lean beef, chocolate and fatty bacon in contact with packaging for 7 and 14 day periods and discovered there were no "migrations" or transfers of lead and mercury to the foods.

Tests were also made to determine effect of abrasion where food is in direct contact with the interior of a carton. After exhaustive practical tests, abrasion was not found to be a factor in contaminating of foods.

Results of these tests were given to FDA. Since there are oil-soluble materials in ink which could stain a carton, industry has performed color transfer tests on reused pulp and paper; Fibreboard, for one, has been engaged in such tests. ■

Rayonier debuts its new modified cellulose

Adhesive and pigment qualities point toward paper sizing, coating

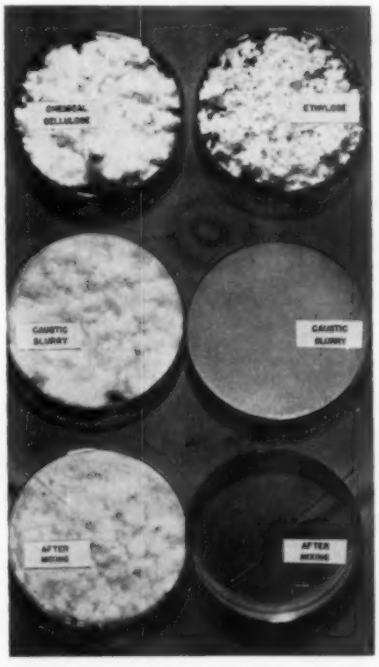
WHIPPANY, N.J.—Ethylose looks and feels like woodpulp, says Rayonier Inc., but behaves differently. Reacted with ethylene oxide, it is insoluble in water, but can be readily dissolved in aqueous alkali to render stable and useful solutions.

Rayonier sees these end-use possibilities: in paper coatings, possibly as an "all-purpose" coating material because of its binding and pigment properties to improve printing, smoothness and gloss; for wet and tub sizing to improve ink receptivity. Other possible end uses are as binders for non-woven fabrics, which now approximate 10 million lbs/year, are expected to grow to 170 million/year by 1970, says Rayonier.

Ethylose is an outgrowth of Rayonier's graft polymer program, is seen by the company as the first in a whole family of modified celluloses in which various chemicals and polymers are grafted onto a basic cellulose backbone. The amount of substitution of ethylene oxide is only 4%. Ethylose differs from viscose, says a Rayonier official, in that it is stable in the small pellet form in which it is prepared as well as in solution.

Rayonier also announced a new plant at its Fernandina Beach, Fla., division to manufacture the new material. The plant uses a continuous, automated process employing new concepts in both reaction principles and in equipment designs. Details on plant operations and process were not disclosed because of patent applications.

Present price for Ethylose is 50¢ lb. in 50 lb. bags. As full scale mill production is attained, the price is expected to be reduced. ■



DIFFERENT REACTIONS of cellulose and modified cellulose (Ethylose) are compared. Ethylose is in the right hand series of dishes. Graft cellulose reacts instantly to caustic, forming a clear solution. Chemical cellulose fibers swell, remain static and unaltered under identical influence of NaOH.

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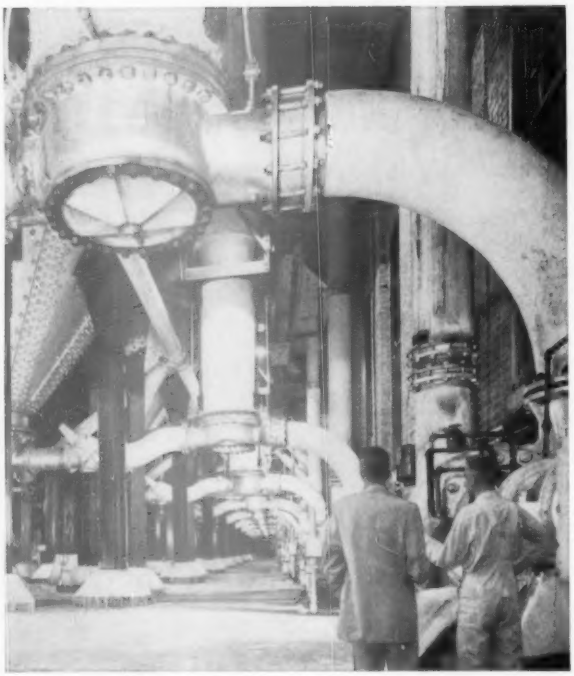

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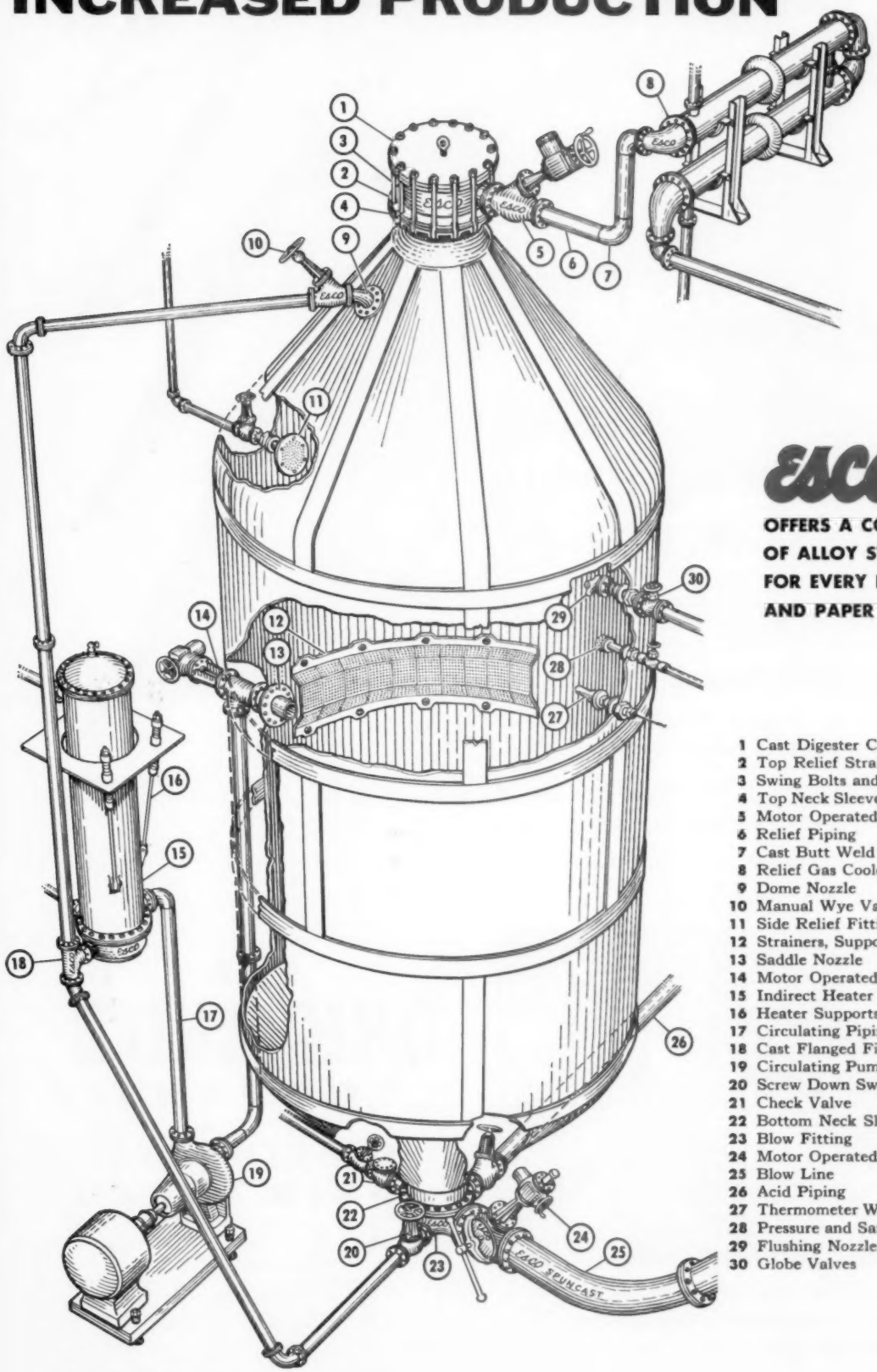

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17 Circulating Piping
18 Cast Flanged Fittings and Flanges
19 Circulating Pump
20 Screw Down Swing Check Valve
21 Check Valve
22 Bottom Neck Sleeve
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Buckeye steps up pulp research pace

Celebrates 40 years of R&D behind its two pulp mills

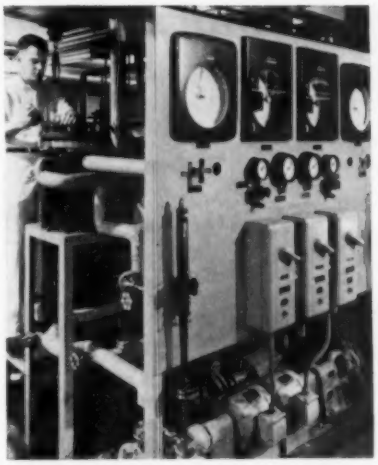
MEMPHIS, TENN.—After more than 40 years, Buckeye Cellulose Corp. obviously believes in the value of research. Its first research effort culminated in Buckeye's 115,000 ton/year cotton linter pulp mill here in Memphis. Its second effort resulted in the 293,000 ton/year woodpulp mill at Foley, Fla., some 500 miles away.

Buckeye's research and development laboratories celebrated their 40th birthday in April, invited PULP & PAPER and several industry magazines to a special symposium to see what it is doing. Buckeye's research is product oriented and is directed towards the needs of the total paper industry. Product oriented research begins at the company's forestry research station at Foley and continues at Memphis. It includes studies of a single fiber such as supermolecular studies and extends to paper strength testing.

Here in Memphis, Buckeye's laboratories consist of 50,000 sq. ft. of well-equipped laboratory equipment. Its staff has been quadrupled since 1951, now numbers 200 including a professional staff of 52 (20 ph. ds., "many masters" and a large chemical engineering degree staff).

Probably the greatest spur to continued research is Buckeye's Foley kraft pulp mill. Before the original mill was built, the Foley process was developed in the laboratory, was put to test of actual production, using logs shipped to Memphis from Florida. The pilot plant's two digesters hold about a 1500 lb. chip charge.

During the conference, Buckeye research chiefs explained accomplishments in such fields as refining, quality control, testing, forestry research and fiber microscopy. The inside story on Buckeye's research activities will be reported in the next issue of PULP & PAPER. ■



PULP PROCESS development laboratory. Technician is bolting head of one of six digesters. Panel instruments provide automatic control.

"Western Star" completes Tacoma shakedown

Menasha starting up 9-pt. plant, Crown Z building new warehouse

PORTLAND, ORE.—Three new industry growth projects on the West Coast are in the news limelight. St. Regis Paper Co's. $32 million expansion at Tacoma, Wash., will be cut into production late this month. The kraft plant's papermaking capacity will then be increased from 230 to more than 700 tpd. and pulp capacity doubled to 800 tpd.

The mill's second machine, named "Western Star," has completed a successful 14-day shakedown run and is now down awaiting completion of pulp mill expansion. Part of the first paperboard it produced was supplied to the firm's Tacoma container plant and there processed on an equally new blocklong corrugating machine.

The Western Star, a Beloit Fourdrinier machine producing 21½ ft. wide web, was primarily designed for producing paperboard but is capable of making a wide range of weights and is equipped for manufacturing extensible paper. Shakedown operation produced paper ranging from 50 to 70 lbs., paperboard from 26 to 38 pounds.

Menasha Wooden Ware Corp. will begin production of 9-point corrugating here at its brand new North Bend, Ore. plant within the next few days. The mid-May target date was recently advanced a week to 10 days. Production sections and controls have been undergoing intensive checkout during the past month.

This new West Coast mill is rated at 125 tpd. It will use 25% alder pulpwood and 75% Douglas fir chips from mill residuals, raw product materials which previously had but little or no marketability in this area. Cooking will be by continuous Pandia digester. Rust engineering built the mill on contract; Black-Clawson provided a large portion of the equipment.

Construction is underway on a 200,000 sq. ft., $1.5 million warehouse and headquarters building for Zellerbach Paper Co. at Portland, Ore. When finished late this year it will permit consolidating sales offices and distribution operations in a central location. The structure will provide increased storage capacity and faster order processing. An in-floor chain merchandise handling system, half-mile in length, will automatically deliver filled orders to shipping dock. Receiving dock will accommodate 5 rail cars and 11 highway trucks simultaneously. ■

Credit Note:

Those readers who wish additional information on the articles in PULP & PAPER's Pulpwood World, April 3, can find it in technical releases of the American Pulpwood Assn.

"Buying Wood by Credit Card," is based on technical release No. 61-R6. On page 72, the article, "Hardwoods, Substitute for Steel on Tractor Rollers," is based on technical release No. 61-R2. "Radio Controlled Logging" is based on technical release No. 61-R35.

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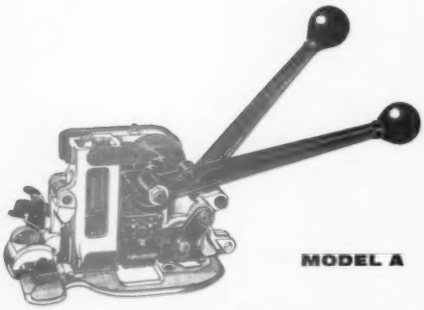

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MODEL AP

- Air power tensioning, adjustable and automatically regulated
- Applies pre-set tension every time
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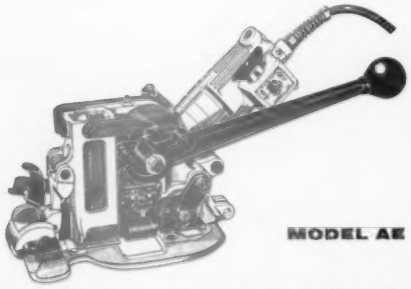
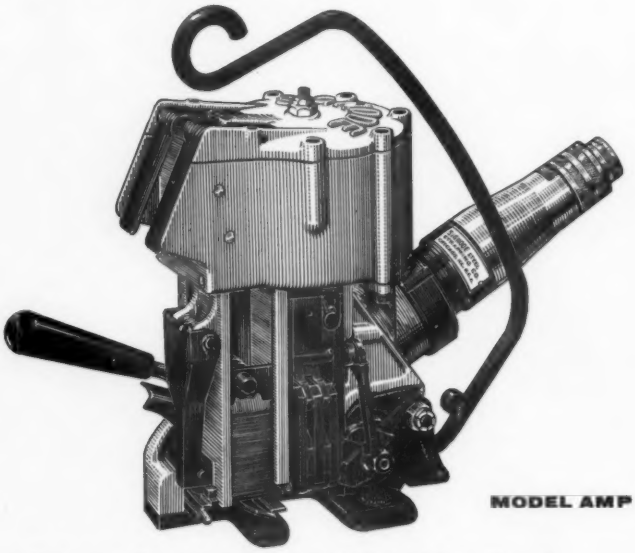


MODEL AE

- Electric power tensioning, adjustable and automatically regulated. Also applies pre-set tension every time
- Manual single-stroke sealing and severing
- Automatic seal feed magazine holds 75 seals



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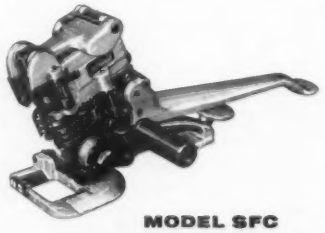

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Crown Zellerbach graduates 28th class

By LOUIS H. BLACKERBY, Western Editor, PULP & PAPER.

CAMAS, WASH.—Washington Gov. Albert D. Rosellini, addressing the 28th graduating class of Crown Zellerbach Paper School here, paid tribute to the students and Crown Z. The students were commended for their efforts in obtaining broader professional knowledge; the corporation for making these opportunities available and for its high degree of forest utilization.

To the graduates he stated: "In my judgment you are contributing to one of our greatest assets—the type of work force we have." His state, according to the governor, is recognized for productivity exceeding the national average by about 15%.

This unique school dates back to 1933 when the Camas mill staff undertook a series of classes in which local employes could participate. It subsequently grew into a full one-year course, later became a 4-year school. Full university credit from the Camas school are accepted by several western universities and colleges. With broadened participation came corporate support and attendance by members from other CZ divisions within commuting distance of Camas.

Reed O. Hunt, Crown Z president who presented diplomas to the 1961 graduates, was employed at the Camas division at the inception of the starter classes. He pointed out that the school has been a voluntary effort. At the start mimeographed materials were used. It gradually developed into a full study course with its own textbook (now using 3rd edition) written by Crown Z department heads and supervisors.

Mr. Hunt indicated the school is becoming continuously more valuable to both students and the corporation. He said, "I can't accent too much the significance of what is going on here. In the years ahead . . . turn to p. 27

FOURTH YEAR GRADUATES get diploma, copy of school's textbook "Making Paper," 2 yr. PULP & PAPER subscription. Front row (l. to r.): LeRoy Dybing°°, Robert S. VanArnam°°°°, Norman L. Riley°°, John L. Seibert°°°, R. Burton Elledge°, William Powers, Roger L. Bouse°, Pell V. Voorheis; Middle row: Stephen F. Layton, Elmer J. Turja, Edward L. Sullivan, Walter E. Sinclair, George T. Poulos, James A. Leith, Michael J. Simmons°, James M. Nutt°, Paul Applegate; Back row: Lynn W. Burdick, Max King, Charles W. Walstrom Jr.°, Kenneth E. Harding°°°, Blaine B. Petersen, David H. Hartley, Edmond C. Mead°, George O. Thomas, Kenneth E. Steinmeyer, Richard L. Carlson, James F. Cormack, Dale A. Heisler° (not present).

Crown Zellerbach Paper School Administration

Regents: R. O. Hunt, president, Crown Z. Corp., San Francisco; R. A. Butler, res. mgr., Camas Div.; R. A. Dupuis, res. mgr., West Linn Div.

Director: C. V. McDonald, office mgr., Camas Div.

Advisor: H. R. Amberg, mgr. of chem. & biological research, Central Research Dept.

Administrators: F. T. Dowdy, supervisor mill purchases; J. P. Blaschka, asst. supervisor, coating & sizing; M. L. Custis, asst. kraft mill supt.; C. W. Davidson, supervisor of prod. quality & development; F. P. Wightman, senior engr.; P. F. Barnett, project engr.-general; R. G. Carter, div. industrial engr.; J. F. Shank, section head-converting plant.

° West Linn Div.; °° St. Helens Div.; °°° Western Waxide Div., No. Portland; °°°° Waterways Terminals, Portland; °°°°° Portland office; °°°°°° Veneer Div., St. Helens

SECOND YEAR CLASS receives certificates of graduation from school's general division. Front row (l. to r.) Richard H. Schaubel°°°°°, Robert M. Berry, Gerald R. Dove, Wallace F. Urbick°, Myrtle G. McLay°°°, Judge L. Dixon, Robert B. Chambers, Bill L. Hawkins°°; middle row, William H. Ward, Lloyd M. Barnett, Edwin R. Heberlein, George W. Rindflesch°, Max L. Baer°°, Lee Kirkpatrick, Jack M. Denman°°°, Archie W. Mayo°°°°°°, Gene R. Harrel°°; back row, Otto P. Woldeit°°, Ray A. Goodall°°, Michael J. Armstrong°, Wyverne L. Caldwell, Kenneth N. Titterington, Darrell W. Jones°°°, Otis J. Thompson°°, Richard P. Simmons°, Hayden H. Hinshaw°°, Marshall Fernandez (not present).

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Trial runs can be set up in your plant by Dow technical personnel. For full details, just call your nearest Dow sales office.

paper processing chemicals

VERSENEX 80

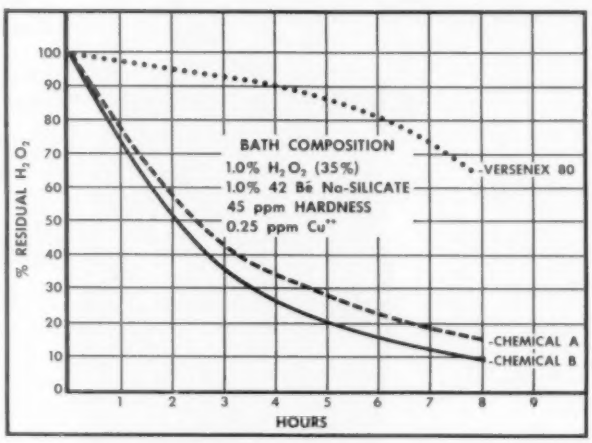
SAVE UP TO $3.50/TON IN GROUNDWOOD BLEACHING, IMPROVE BLEACHING EFFICIENCY WITH VERSENEX 80

Actual mill use is showing substantial savings in bleaching costs by the addition of Versenex® 80 chelating agent to groundwood pulp before bleaching. In some cases, brightness levels are maintained with less peroxide when Versenex 80 is used as a pretreatment. In others, gains in brightness are achieved without increasing peroxide concentration. In either instance, the cost per point of brightness is lowered.

Improvement in the bleaching process with Versenex 80 lies in the fact that peroxide bleach liquors are subject to rapid decomposition. In groundwood bleaching, some 20-30% of the effectiveness of the bleach liquor is "lost," mainly because of the catalytic action of heavy metal ions present in the liquor. Inactivation of these ions by Versenex 80, before the bleach tower, extends the effective life of the peroxide. As a result, savings of up to $3.50 per ton in chemical costs are being realized in actual mill operation.

A comparison of Versenex 80 with other commercially available aminocarboxylic acids is shown in the graph at right. Versenex 80 pentasodium salt of diethylenetriaminepentaacetic acid is shown to be significantly superior to either tetrasodium salt of ethylenediaminetetraacetic acid (chemical A) or trisodium salt of N-hydroxyethylethylenediaminetriacetic acid (chemical B) for this application.

Where stray metal ions are causing reversion,



scaling, and other bleaching problems, investigate Versenex 80. For more technical information or for a trial run in your own plant, call your nearest Dow sales office or write us in Midland.

NEWS ON MILL SAFETY

is being made by another Dow product—Chlorothene® NU. It's a cold-degreasing solvent that has no fire or flash point measurable by standard methods and has low toxicity. It may be used by spray, dip, or wipe methods. You can use it safely to clean instruments, oily or greasy parts, calender stack rolls, most electric motors, and in the removal of pitch from the wire. Ask for complete information on this new safety solvent for your maintenance cleaning.

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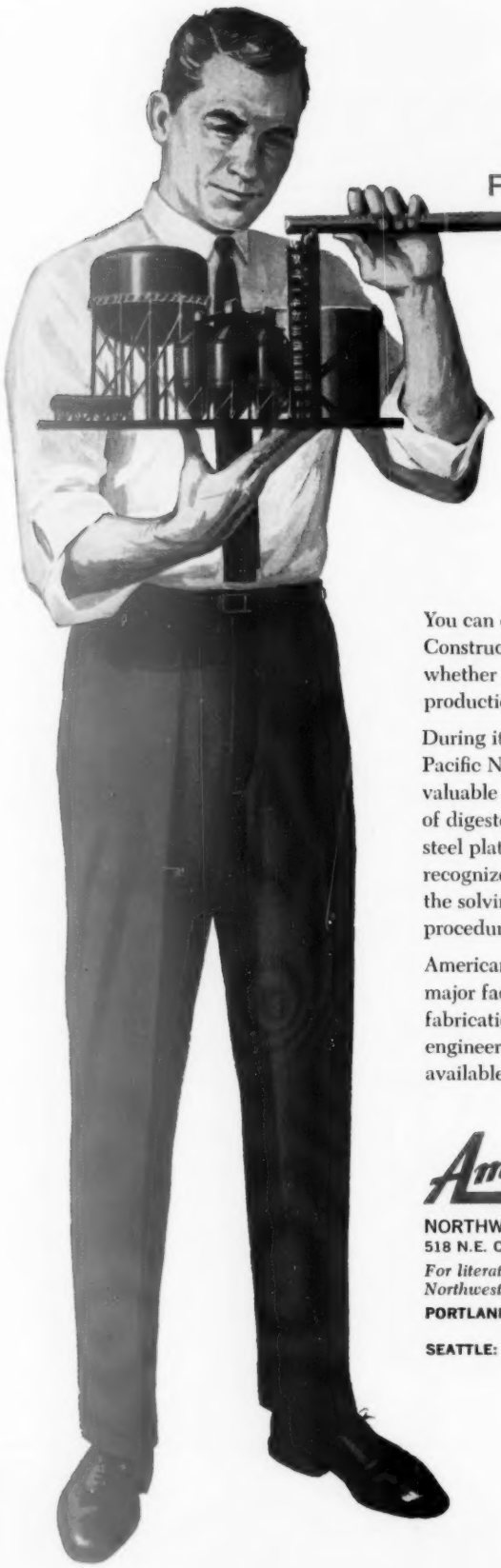

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During its forty years of service to the Pacific Northwest, American has established valuable experience in the construction of digesters, blow tanks, chip silos and similar steel plate fabrication and erection that is recognized in the area. This experience has made the solving of particular problems standard procedure for its engineering department.

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starts on p. 23 . . . it will be increasingly necessary to know a lot more than we have in the past. We will need to know how to make useful products of today's leftovers . . . achievements which are nearer than you might think." Within a few years, according to Mr. Hunt, few present products will be made as they were.

In extending official welcome to the 2nd and 4th year graduating classes, R. A. Butler, res. mgr. of Camas division, said the school has proven to be a "wonderful tool for success" in industry. It makes for constant upgrading of the skills needed to meet increased competition within and without the industry.

Several Crown Z people now holding positions in managerial and executive capacities completed the full 4 yr. paper school course during their earlier years with the firm. Mr. Butler, who qualified as an honor student, was a member of the 1943 graduating class.

Of broad benefit even though it has not been possible to determine objectively the precise extent of benefits derived from CZ's employe educational program, the factors which can be isolated indicate far-reaching effects. In evaluating the program, C. V. McDonald, office mgr. of Camas division and director of the school, stated that professional people considering affiliating with the company for a career in the industry are influenced by the fact that professional educational opportunities are available.

The school enables employes to familiarize themselves with all major phases of the industry from forest management to marketing of finished products. The individual whose acquaintance with the industry would otherwise be limited to departments in which he personally participated has, because of the school, opportunity to obtain knowledge concerning all departments. Research chemists learn of logging, of pulp processes, of papermaking; the pulp or papermaker learns of the scientist's work; etc.

During the past several years the school has been available to employes of all Crown facilities within commuting distance of Camas. Students have enrolled from the West Linn, St. Helens and Lebanon mills; from the woods operations and central research; from offices, divisions and subsidiaries in the Portland area.

The school consists of two divisions —general (1st & 2d yrs.) and technical (3rd & 4th yrs.). The general section, available to both men and women employes, covers the full scope of operational phases—ranging from forestry through pulp processes and quality control the 1st year, from papermaking through management the 2d year. About one-third of the general division classes involve mill visits enabling students to get first-hand acquaintance of the entire operation. The technical division, available only to men, covers the same respective subject range in the 3rd and 4th year courses but treating subjects more comprehensively.

All students qualifying for diplomas prior to 1960 did so by successfully completing the full 4 yr. study course. Effective with the 1958-59 school year, direct entrance into the beginning upper-division class became possible by passing entrance examinations. This enables individuals having sufficient industry knowhow, acquired through experience or formal education, to enroll for the technical division without first completing the first two years. Nineteen students to date have graduated from the school as result of entering the 3rd yr. class via entrance examination in lieu of 2 yrs. of general division classes. This year's graduates includes 10 such students; the 1960 class had nine.

AWARDING DIPLOMAS for completing 4 yr. course of Crown Zellerbach Paper School. George T. Poulos (left), Camas div. accountant, receives his from CZ Pres. R. O. Hunt.

Number of employes completing course requirements in 28 yrs. at Crown Zellerbach Paper School:

Paper School:	
4th yr. class	598
3rd yr. class	758
2nd yr. class	1282
1st year class	2030
Completing 1960-61 school year:	
4th yr.	27
3rd yr.	24
2nd yr.	26
1st yr.	62

Honor awards in second year paper school class were made to Lloyd M. Barnett, Purchasing Department, Camas, "Pulp and Paper—Vol. 1" by Casey; Kenneth N. Titterington, Kraft Mill, Camas, "Chemistry of Pulp & Paper Making" by Sutermeister; Otis J. Thompson, Pulp Mill, St. Helens Division, "Pulp & Paper Manufacture—Vol. I (McGraw-Hill) ■

Summer institute program set at Maine

ORONO, MAINE—The technical program for the first session of the Summer Institute for the pulp and paper industry is scheduled for July 10 to July 27 at the University of Maine. The program includes fundamentals of pulp technology and stresses new pulping processes, recovery, bleaching and pulp mill costs and management. Enrollment to date is good, but there are still some openings for additional applicants.

Subjects and lecturers are: Production of Pulp and Paper—J. C. W. Evans, editor, Paper Trade Journal; Forest Management—Prof. Harold Young, Univ. of Maine; Structure of Wood—Prof. Fay Hyland, Univ. of Maine; Chemistry of Cellulose and Lignin—Prof. Irwin Douglass, Univ. of Maine; Wood Preparation—Wood Room—N. P. Wardwell, Carthage Machine Co.; Acid Pulping—Acid Preparation—Prof. L. C. Jenness, Univ. of Maine; Acid Pulping—Cooking and Recovery—W. D. Kerr, Fraser Co., Ltd.; Alkaline Pulping—To be selected.

Recovery Units—V. P. Owens, Combustion Engineering Inc.; Mechanical Pulping—Prof. Fred O'Neil, Syracuse Univ.; Semi-chemical Pulping—R. W. Doe, West Virginia Pulp & Paper Co.; Pulp Screening and Cleaning—representative of Improved Machinery Co.; Bleaching—Prof. H. Rapson, Univ. of Toronto; Pulping Process Costs—F. G. Perry, Jr., A. D. Little, Inc.; Pulp Mill Management Panel—W. H. Chisholm, president Oxford Paper Co., R. H. Cutting, president, Keyes Fibre Co., H. C. McDonald, president, Great Northern Paper Co. ■

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for Paper Machine Dryers

SUPER TYPE L-N
JOHNSON JOINT
with "Quick Release" Nipple

Best Design Yet for getting steam into dryer rolls with rotating syphon pipes. Needs no lubrication or adjustment. Has only a few simple parts—less chance of trouble plus easier field servicing. Assembly plate provides ready access to syphon pipe.

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SUPER Construction . . . *and Stamina* — Teams rock hard "Green Streak" seal rings with special Ni-Chrome plating, slashes friction load and increases service life.

Easy on . . . and off — "Quick Release" nipple uses powerful wedging action to lock joint in place. Install it—or remove it—with just an end wrench.

Trial offer still goes. We'll gladly furnish a pair of Joints and Syphons for 90-day trial in your own mill, without cost or obligation. Ask for details.

Engineers' Data Book summarizes research behind this new development, has full technical information. Ask for copy of: "Condensate Behavior in Paper Machines."

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849 WOOD STREET • THREE RIVERS, MICHIGAN

Rotary Pressure Joints • Direct Operated Solenoid Valves

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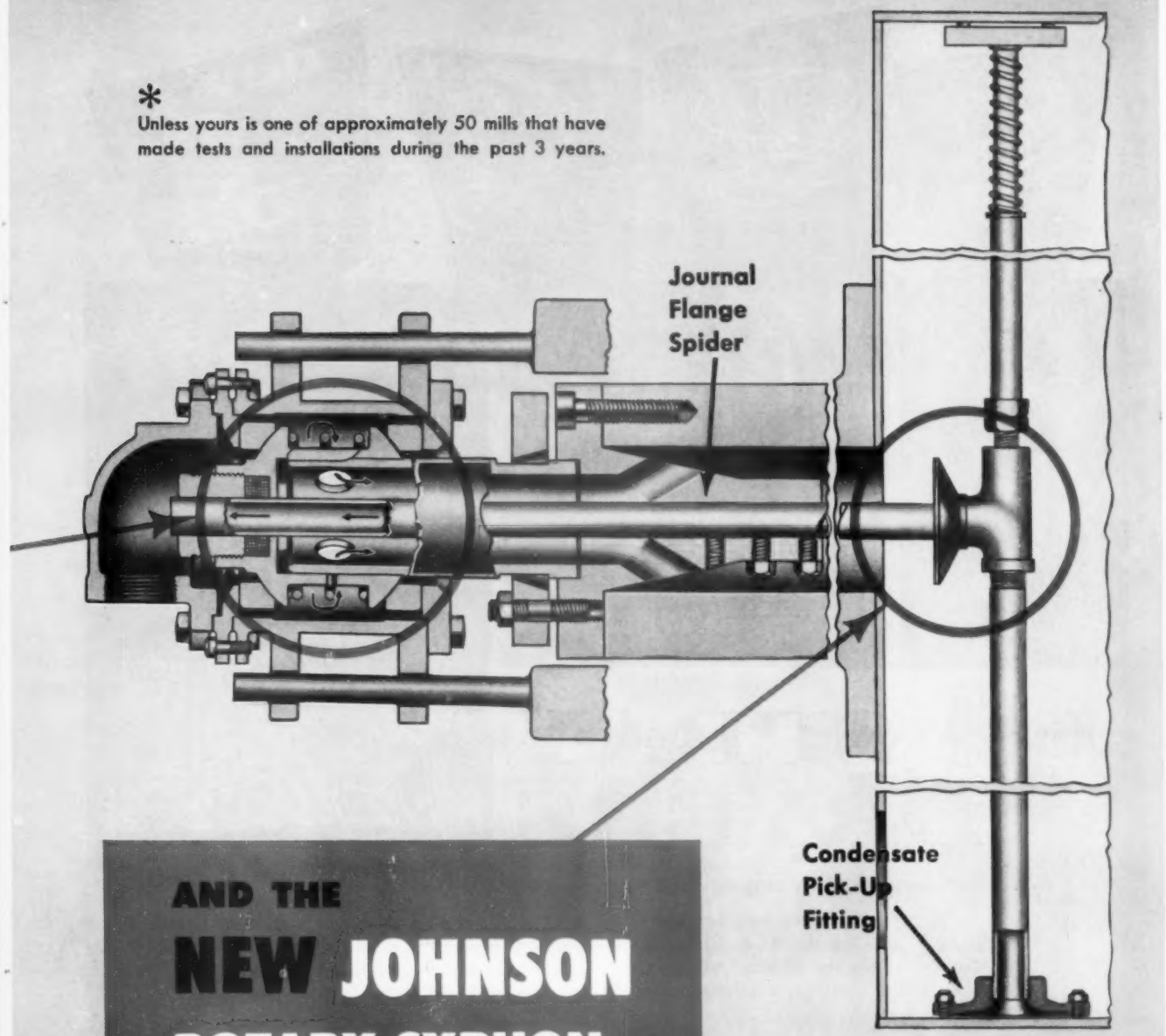

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Better Drainage of dryer rolls results from a new concept of condensate pick-up design. Holds condensate to a minimum. Rotary Syphon can be located any place along the dryer shell. Helps to reduce horsepower requirements.

Higher Roll Temperatures—Thinner condensate film means better transfer of heat units to dryer shell. Better drying can be translated directly into increased production.

Easier Installation—No need to get inside dryer to drill and tap dryer head. Install right through manhole. For rolls with handholes only there's even a journal-inserted rotary syphon.

Reduced Maintenance—Only a few simple trouble-free parts. Ends bearing wear caused by unnecessary water weight and prolonged "cascading." Easily removed for inspection.

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Natwick retires June 15; Brown new mgr.

EVADALE, TEX.—Albert G. "Buff" Natwick, one of the industry's most widely known leaders who has helped many a younger executive up the ladder, and his wife, Cece, are retiring June 15 to their farm high above the Columbia River, near Camas, Wash. He has been vice president, production, East Texas Pulp & Paper Co., since June 1956 and came here to assist in design and construction in early 1953, serving as resident manager since the start-up.

President Mike Buckley said, "We are going to continue to use his long experience and sound judgment in a consulting capacity."

Born in Wisconsin Rapids, Wis., Mr. Natwick graduated from the University of Chicago. He served many years as assistant resident manager of Crown Zellerbach's big Camas mill, "world's largest specialty mill," with special responsibility over quality, personnel and production matters. He also was dean of internationally famous Camas "Paper School" (see story this issue) from its inception until 1953.

NATWICK

BROWN

Mr. Natwick's son, Ben, is Pacific Coast representative for Appleton Wire Works, Vancouver, Wash., near Camas. Others of the family are in paper and allied fields and also nationally known in the arts and theater.

Ray Brown, who moves up from assistant to resident manager at Eastex, was born in Fisher, La., and was pulp supt. at Crown Z's St. Helens, Ore., mill before coming here in 1954.

R. L. Paret advances from plant engineer to production manager. L. P. Bundy, electrical supervisor, becomes plant engineer. W. E. Merrem, vice president and veteran of 37 years with Eastex and its Southwestern Settlement and Development Division (woodlands), retires May 31 but continues as consultant. ■

Dr. Reagh heads Weyerhaeuser pulp research

TACOMA—Appointment of Dr. J. D. (Jack) Reagh Jr. as research director of the pulp and paperboard division of Weyerhaeuser Co. is announced by Vice Pres. Howard Morgan. Dr. Reagh is to succeed Harold A. Bialkowsky who resigned after heading the division's research activities at Longview, Wash. for nearly 20 years. Dr. Bialkowsky will continue to be affiliated with the industry but has not yet identified the firm with which he will be associated. Dr. Reagh joined Weyerhaeuser in 1950 as research supervisor at Longview research center. Since 1954, he has been associate director of the research dept., Everett.

Dr. Reagh, native of Fairbanks, Alaska, is the son of a "sourdough" pioneer. He attended Stanford University and earned his ph.d. at Cambridge University. During his earlier experiences in cellulose research, he was with the DuPont Company of Wilmington, Del., and he is author of a number of technical publications. ■

REAGH

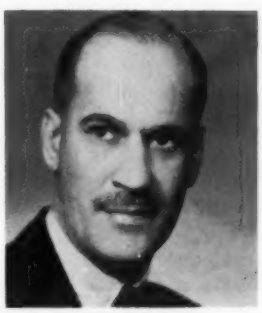
Peter MacDougall joins Bulkley Dunton

NEW YORK—Peter L. MacDougall, active in the international woodpulp sales field for the last 14 years, has joined Bulkley Dunton Pulp Co. Inc. He is reporting to the New York company headquarters for future assignments, announces E. J. (Jack) Rose, president of Bulkley Dunton Pulp Co.

Mr. MacDougall has been in the paper sales business more than 20 years and was pulp sales manager for Howard Smith Paper Mills Ltd. of Canada from 1946 to 1960. During the same period he was sales manager for newsprint for the affiliated Donnacona Paper Co. Ltd. From Nov. 1960 to Mar. 1961 he was pulp sales manager for Stora Kopparberg Corp.

Born in Montreal, Mr. MacDougall attended Bishop's College School, Lenoxville, Canada, and Wrekin College, Wellington, Shropshire, England. He started in the industry in the woodlands dept., Price Bros., Ltd., in Canada in 1935. He joined Howard Smith two years later.

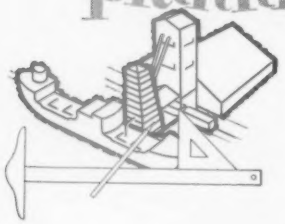
In 1940 he enlisted in the Royal Rifles of Canada, serving in the Pacific Theater as a lieutenant. He was captured and held in a Japanese prison camp in Hong Kong from 1941 to 1945. ■



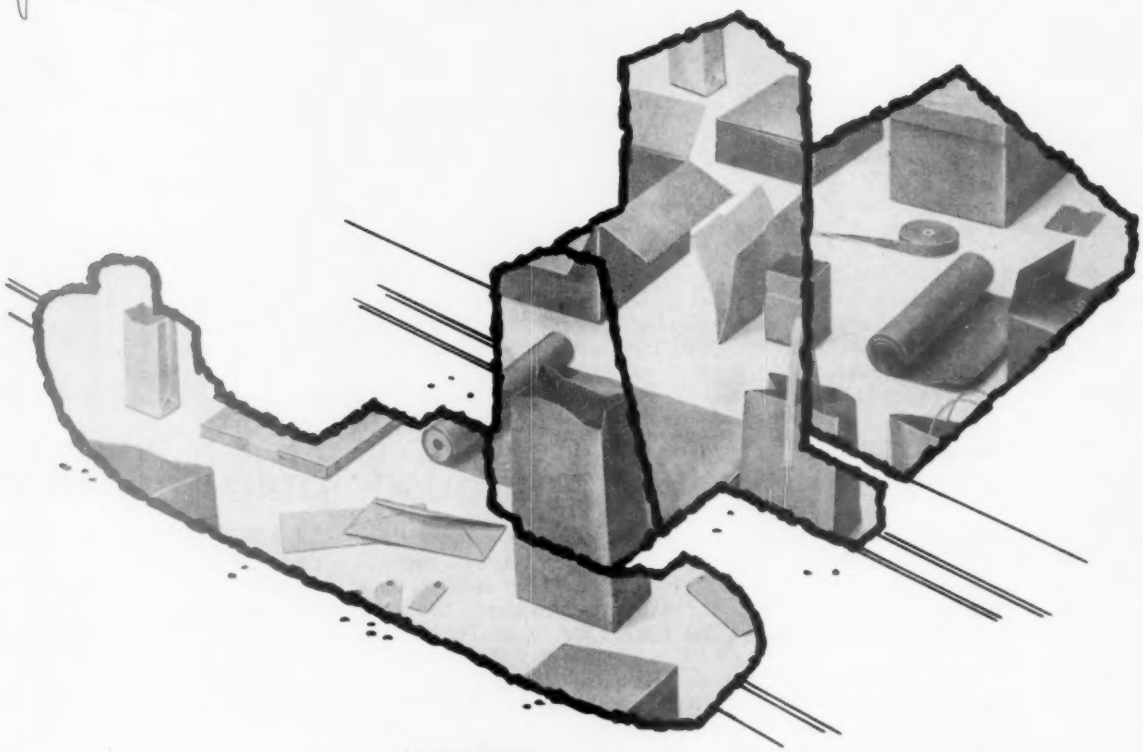
MacDOUGALL

WEST END

advance planning



OF SALT CAKE STORAGE DEPOT ANTICIPATES INDUSTRY'S GROWING NEEDS



WEST END identity as a prime nationwide supplier of highest quality salt cake is underscored by Stauffer of Canada storage depot . . . the West End project that solved the problems of time and cost of other means of transportation. Customers benefit from reduced inventory requirements, lower transportation costs and prompt delivery.

Stauffer CHEMICALS

WEST END CHEMICAL COMPANY • DIVISION OF STAUFFER CHEMICAL COMPANY

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Checkmate forest fires

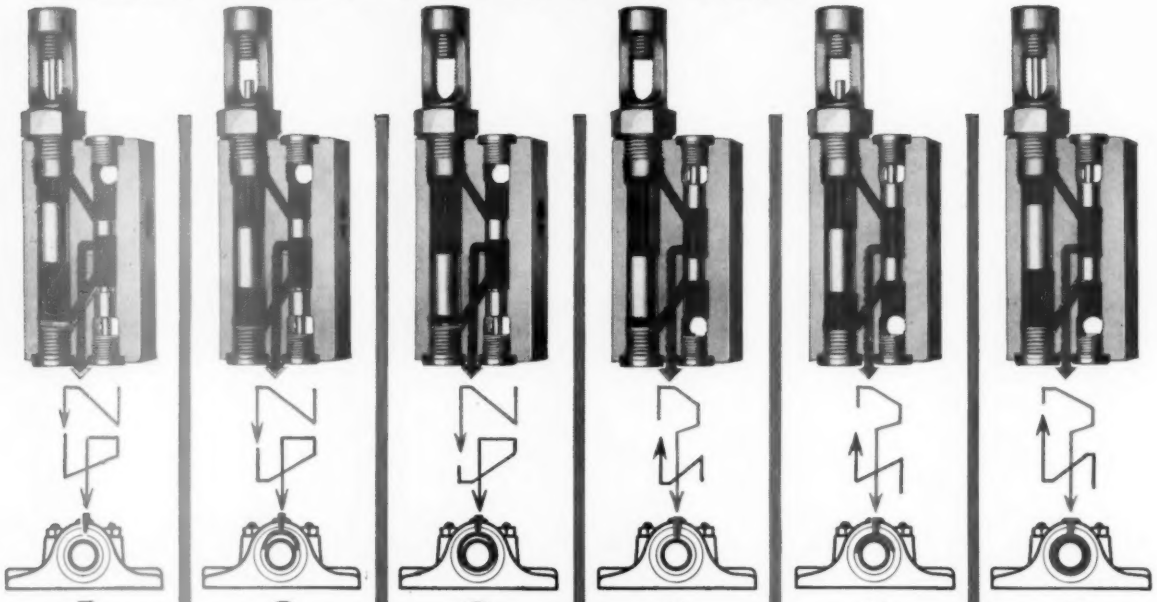
Fires ravage about five million acres
of woodland and range annually in the United States.
Prevention is everybody's job!

Weyerhaeuser Company

Pulp and Paperboard Division

Here's design simplicity

Farval's Time-Tested Dualine Valve



1

(In red) Lubricant under hydraulic pressure enters inlet at top right — pushing slide valve down and filling upper diagonal passage and chamber above main piston.

(In blue) By this movement, lower head of piston slide valve uncovers lower diagonal passage leading from the main piston chamber. This chamber is full of lubricant from the previous operation.

2

(In red) Lubricant under pressure entering through upper inlet port and into main chamber continues to force main piston downward —

(In blue) discharging lubricant through lower diagonal passage to vertical passage and to outlet port leading to bearing.

3

(In red) Lubricant entering from upper port has now forced the main piston to end of its stroke, and thus the full measured charge below piston has been delivered to the bearing.

Note that indicator stem has also moved down, indicating main piston has reached end of its stroke, and that no more lubricant will be delivered from this operation.

4

(In blue) Lubricant under hydraulic pressure enters inlet at bottom right — pushing slide valve up and filling lower diagonal passage and chamber below main piston.

(In red) By this movement, upper head of piston slide valve uncovers upper diagonal passage leading from the main piston chamber. This chamber is full of lubricant from the previous operation.

5

(In blue) Lubricant under pressure entering through lower inlet port and into main chamber continues to force main piston upward —

(In red) discharging lubricant through upper diagonal passage to vertical passage and to outlet port leading to the bearing.

6

(In blue) Lubricant continuing to enter under pressure from the lower port has now forced main piston to the end of its stroke, and thus the full measured charge above piston has been delivered to the bearing.

Indicator has reached its top limit, showing the job is done.

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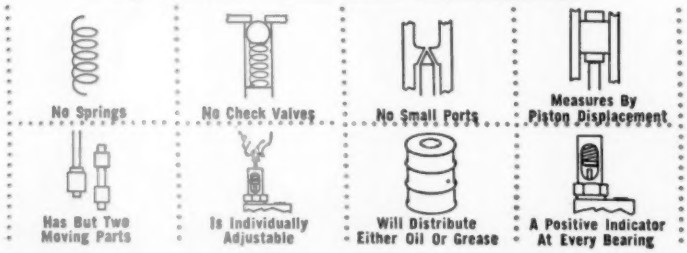
No Springs
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Will Distribute Either Oil Or Grease
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Oxford makes three management changes

NEW YORK—Theodore E. Bruning has been elected vice president, finance, Oxford Paper Co. He joined Oxford in 1928 as cashier and has successively held the positions of auditor, controller, assistant treasurer, treasurer, and since 1953, has been vice president and treasurer.

Gorham H. Scott, assistant to the president, has been elected a vice president. He is also vice president of the Rumford Falls Power Co., an Oxford subsidiary, and a director of the First National Bank of Portland. Mr. Scott has been employed by the company since graduating from Bowdoin College in 1929, working in Portland, Maine, until 1957 and since then in the company's New York offices.

BRUNING

SCOTT

AYER

B. Frederick Ayer has been elected treasurer of Oxford Paper Co. He is a graduate of Northeastern University and Bentley School of Accounting. He joined the company in 1942 and has held the positions of assistant treasurer and then treasurer of the Rumford Falls Power Co. Since June 1, 1960, he has been assistant treasurer of Oxford. ■

Horton joins Stora as district mgr., pulp sales

NEW YORK—Morrison S. Horton has been named district manager—pulp sales of Stora Kopparberg Corp., according to an announcement by Robert L. Nash, vice president.

Mr. Horton is responsible for sales of pulp in the Midwest and Southeastern states from Stora's new pulp mill now being constructed by an affiliate, Nova Scotia Pulp Ltd., on Cape Breton Island, Nova Scotia. He will also handle sales of Stora's Swedish grades in these same areas. His headquarters are at 230 Park Ave., New York.

For the past eleven years, Mr. Horton has been associated with Mead Pulp Sales Co. in Chicago, and later in New York. Prior to that he was with the Pulp Division of St. Regis Sales Corp. in the Midwest, with his offices in Chicago.

Mr. Horton attended Princeton Univ. and, during World War II, he served in the United States Navy. His naval service was in the Pacific War Theatre.

He was born in Orange, N.J. A year ago last November, Mr. Horton was married to the former Dolores Franklin of Midland, Texas. They reside in Manhattan. ■

HORTON

Late announcements:

Len J. Forrest, Hoquiam, Wash., and Michael A. Brown, N. Y., to vice presidents, Rayonier. Mr. Forrest heads Northwest Timber Division, becomes ranking executive in Pacific Northwest. Mr. Brown heads sales.

Dr. R. W. Reed to Asst. Mgr., mfg., Printing Paper Div., St. Regis.

Dr. Keith W. Max, dir., research and development, Containerboard and Kraft Paper Div., Continental Can.

STRICTLY PERSONAL . . .

East

George Browder has joined National Starch and Chemical Corp. in engineering sales, working out of New York and developing sales of National's Instant-Lok system of adhesion . . .

Donald I. Harmon has been promoted to mgr. converting paper sales, Hollingsworth & Whitney Div., Scott Paper Co. . . . **Edmund T. Hittson** is now mgr., tabulating cardstock sales with the same division. . . . **John W. Hall Jr.**, has joined the sales dept. of Texas Gulf Sulphur Co. . . .

Walter E. Brewer is named to new post of general sales mgr., industrial division of Nopco Chemical Co. Since 1959 he has been sales mgr. of Nopco's Textile Fibre Dept.

P. Koplik

M. Koplik

New Woodpulp, Paperstock And Paper Firm is Formed

Perry H. Koplik & Son, Inc., 745 Fifth Ave., New York City, . . . **turn to p. 106**

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The 36-2 Sprout is the most efficient disc refiner *in quantity of output and in quality of refined pulp* per horsepower input. It is preferred throughout the industry for every pulping application where rubbing and brushing action, without cutting, is required.

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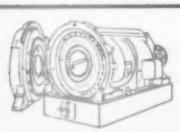
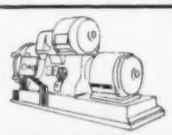
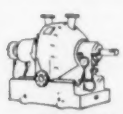


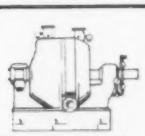
36-1 • REFINERS • 36-2

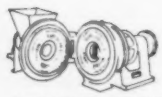


DOUBLE DISC REFINERS



20"-26" • PRESSURIZED REFINERS • 34"-42"





LABORATORY REFINERS

MEETINGS

. . . May

TAPPI Coating Conference, Statler-Hilton Hotel, Buffalo, N. Y.—May 8-10

TAPPI and the Instrument Society of America Pulp & Paper Instrumentation Symposium, Northland Hotel, Green Bay, Wis.—May 10-12

National Paperboard Assn., Fairmont Hotel, San Francisco, Cal.—May 10-12

Pennsylvania-New Jersey-Delaware Div. PIMA, spring meeting, Yorktowne Hotel, York, Pa.—May 11-13

Connecticut Valley Div. PIMA spring meeting, Woronoco Park, Woronoco, Mass.—May 18

Michigan Div. PIMA, joint recognition night with TAPPI, Gull Harbor Inn, Richland, Mich.—May 25

Institute of Paper Chemistry Executives' Meeting, Appleton, Wis.—May 25-26

. . . June

CPPA conference on Chemical Pulping and Bleaching, Saranac Inn, New York—June 7-9

PIMA National Meeting, Hotel Robert Meyer, Jacksonville, Fla.—June 7-9

Maine-New Hampshire and New England Sections TAPPI, spring meeting, Wentworth by the Sea, Portsmouth, N. H.—June 9-11

Institute of Paper Chemistry, Sixth Seminar, Appleton, Wis.—June 11-30

Western Michigan University Pulp and Paper Conference on Electrical Engineering, Kalamazoo, Mich.—June 21-23

. . . August

TAPPI Lignin Symposium, Edgewater Beach Hotel, Chicago—Aug. 14-16

. . . September

TAPPI, 11th Corrugated Containers Conference, St. Francis Hotel, San Francisco, Calif.—Sept. 6-8

CPPA, TAPPI, Fourth International Mechanical Pulping Conference, Edgewater Beach Hotel, Chicago—Sept. 19-21

NW Div. PIMA, fall meeting, Faust Hotel, Rockford, Ill.—Sept. 20-22

British Paper and Board Makers Assn., International Fiber Bonding Symposium, Oxford, England—Sept. 25-29

. . . October

TAPPI Annual Engineering Conference, Shoreham Hotel, Washington, D. C.—Oct. 15-19

Packaging Institute, 23rd Annual National Packaging Forum, Biltmore Hotel, New York—October 18-22

PIMA, TAPPI—Joint Meeting, Equinox House, Manchester, Vt.—Oct. 19-21

. . . November

TAPPI, Annual Alkaline Pulping Conference, Rice Hotel, Houston, Texas—Nov. 1-3

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There have been many recent advances in evaporation techniques and equipment. Unless you are already enjoying their benefits, your competitive position may be vulnerable.

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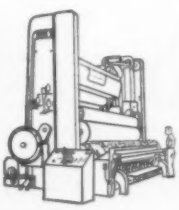
AA-393

INTEGRATED ROLL PRODUCTION SYSTEMS



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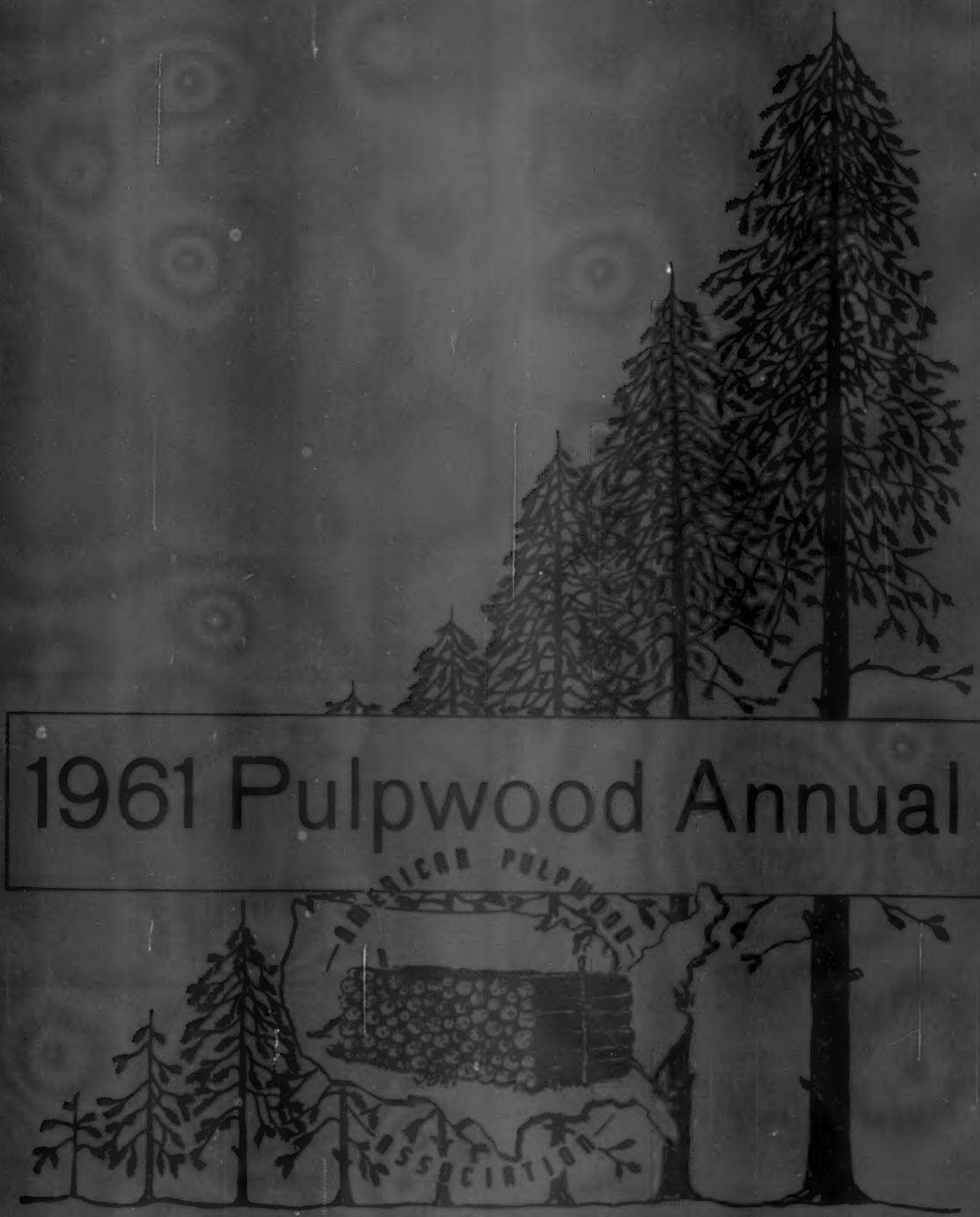

1961 Pulpwood Annual

Papers Presented at the
Annual Meeting of the American Pulpwood Association

Prepared by American Pulpwood Association
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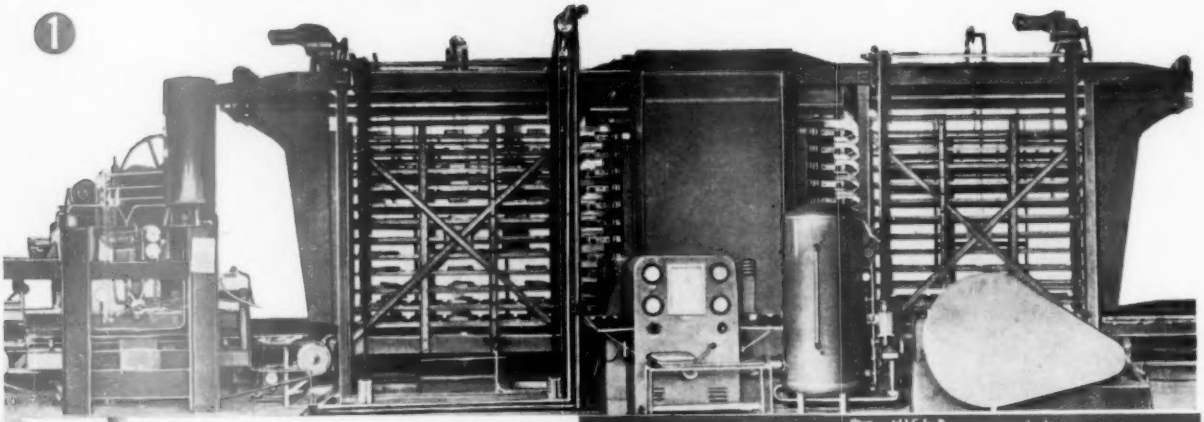

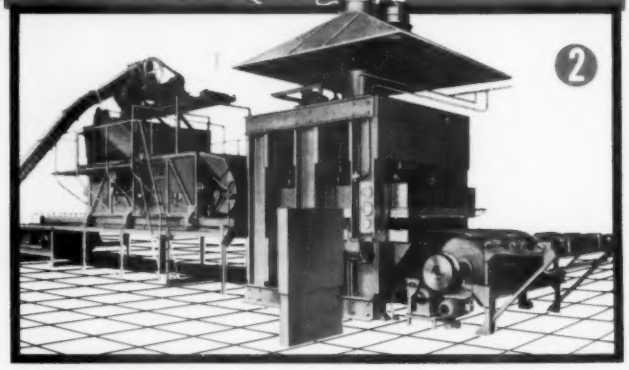

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PULPWOOD ANNUAL—1961

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FOREWORD

Pulpwood consumption increased in 1960 to a peak of more than 40,000,000 cords. This height was reached in spite of a leveling off of demand the latter part of last year that is extending into the current year.

The meeting papers covered by this Annual and the lists of technical releases and papers included provide guide lines for our industry by which it can reduce costs and increase efficiency in this highly competitive period that faces our economy.

These official papers, presented at the 1961 ANNUAL MEETING of APA have been edited by PULP & PAPER, a Miller Freeman publication, as in previous years.

We appreciate very much their cooperation in making this ANNUAL available to our members and others interested in the Pulpwood Industry.

W. S. BROMLEY
Executive Secretary

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220 East 42nd Street, New York 17, N.Y.

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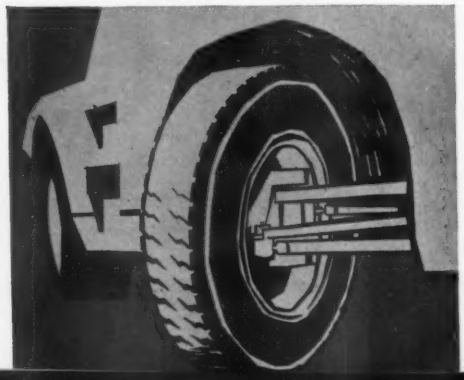

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DEDICATION

KARL A. SWENNING

The Association dedicates this issue of the Pulpwood Annual to its third president, Karl A. Swenning.

Karl was born in Boras, Sweden but received his education in the United States.

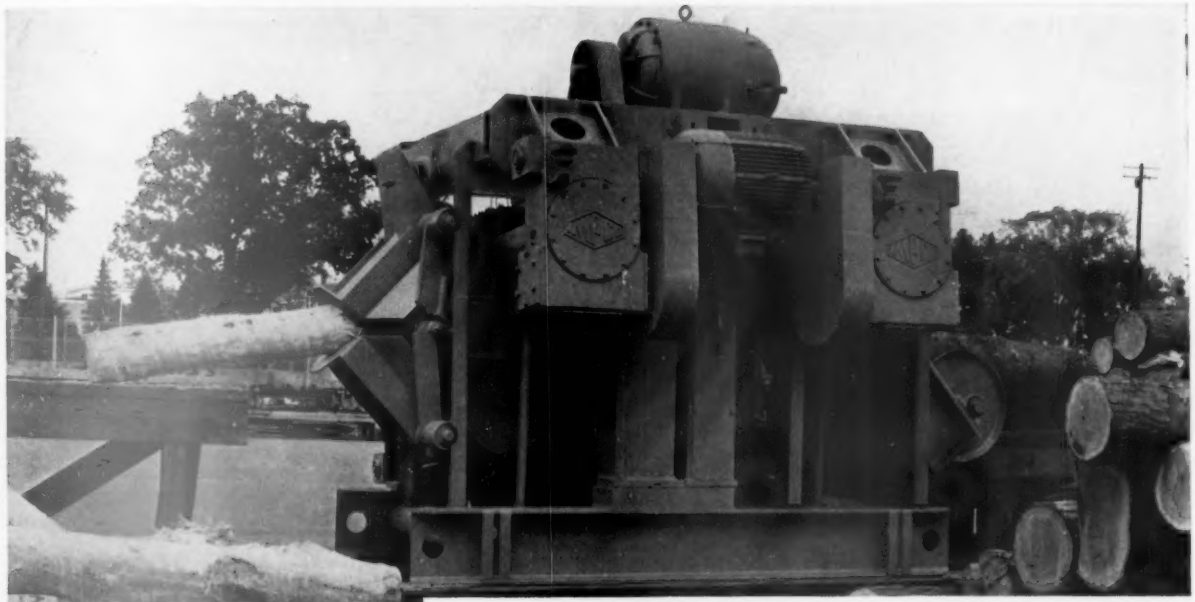
His technical training was interrupted by military service during World War I, at which time he earned the rank of Ensign as a Naval Aviator. He graduated with honors from the New York State College of Forestry, Syracuse, in 1920.

His career, as a Woods Manager, spans an era of significant changes in the practice of forestry and timberland management.

Following graduation from forestry school, Karl went to work for The Mead Corporation, Kingsport, Tennessee. In 1939 he left Mead as General Woods Manager and accepted the position of Assistant to the Executive Vice President, Brown Company, Berlin, New Hampshire. In 1942, he joined the Hollingsworth & Whitney Paper Co., Waterville, Maine, as General Woods Manager. In 1954, Hollingsworth & Whitney merged with Scott Paper Company. He is now Director of Timberlands for Scott.

Karl is currently: a member of the APA Board of Directors, having served in this capacity since the Association was founded in 1934; member and chairman of the Northeastern Forest Research Advisory Council; Past President of the Southern Pulpwood Conservation Association; and Member of the Society of American Foresters. He continues a most unusual service to the pulpwood industry as a whole and to the Association in particular as Chairman of its Legislative Committee.

"Hanging his hat" in his office at International Airport, Philadelphia, Pennsylvania, Karl continues to pursue his lifelong convictions that pulpwood can and will remain competitive in an unregulated economy.



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FOREST POLICY FORUM

"The company executive looks at his woodlands organization"

REAL CHALLENGE facing the industry is how to unleash creative potential that exists in thousands of intelligent, highly trained men in the industry. Here, a new pulpwood logging idea is examined by a Southern organization.

Profits are Required

for economic growth, which is more hazardous than forest growth

"*The Long Range Trends of the Pulp and Paper Industry*" —J. R. Kimberly, Chairman of Board, Kimberly-Clark Corp.

KIMBERLY

NATURAL GROWTH of forests is relatively uniform and fairly predictable. On the other hand, economic growth is neither uniform nor readily predictable. First, let us turn our attention briefly to the subject of growth in our general economy—its meaning and purpose, and the prospects for future growth.

Then, we will take a look at recent growth trends in our industry and current projections of future growth.

Thirdly, we will briefly consider an important challenge to the orderly future growth of our industry—the challenge of adequate profits and adequate return on investment. We will examine what we, as practical businessmen, can do about this serious problem.

Finally, we will indulge in some of that "blue sky projecting" of what appear to be significant future trends of the pulp and paper industry.

We start with economic growth first, because future pulp and paper industry sales, production and profits will be closely tied in with growth of our nation's economy. Second, because informed business leaders should be encouraged to think through the real meanings of economic growth and then make their views on economic growth known to their elected government representatives.

The best short definition of economic growth I have heard is that of Solomon Fabricant of the National Bureau of Economic Research in which he says simply, "Economic growth may be defined as the increase in national product per capita."

Understanding this basic definition may help us penetrate the fog banks of political oratory and to evaluate proposed government spending programs that will be offered to try to stimulate our economic growth rate in months ahead.

Over the long-run, the U. S. rate of growth has been as high, or higher, than any country in the world. But in recent years, per capita output in the United States has in fact, shown little, if any, rise, according to John Sinclair, president of the National Industrial Conference Board.

The purpose of economic growth according to general American opinion, is to raise and improve the economic welfare of the individual. This is in sharp contrast to the Communist state, where economic growth is for the benefit of the state today, with the promise of a better life for the individual at some future tomorrow.

This difference in purpose is one

of the most serious problems facing Americans in the years ahead. The apparent national desire for shorter working hours and more leisure is one of the factors contributing to our lower rate of economic growth in the past. Can this industry, and indeed this country, afford this in a largely hostile world?

Now, for that pay-off question, can the U.S. achieve a faster growth rate if we want to? There are many prescriptions for this – including more government spending, intensified research efforts, expanded education programs, a more equitable tax structure to encourage investment – and many more. But, the real secret lies in four words: Raise per capita productivity. This is the only ultimate answer to the problem of increasing our national rate of economic growth.

The real challenge ahead is a test of our ability as a nation to maintain a competitive rate of growth, while at the same time preserving individual and business freedom. This is a sobering challenge, indeed, but it is a crucial one for business leaders to ponder. Personally, I think we have the brains, the ingenuity and the moral fiber to work our problems out. But, work them out we must, if we are to meet the challenge of the sixties.

Growth trends of pulp and paper industry and projections of future growth should be considered first from the standpoint of what has been happening to growth in per capita consumption. Inasmuch as the best measure of real growth is in per capita terms, what has been the record of the pulp and paper industry since World War II? Per capita consumption of the products of our industry has grown considerably faster than the gross national product per head. This faster growth relative to the economy, when combined with the growth of the population itself, has led to a large increase in the total consumption of paper and board.

A preliminary estimate of 1960 consumption of paper and board is about 39 million tons, 77% greater than the 1946 level of 22 million tons. Apparent per capita consumption in 1960 of about 432 lbs. was a little below 1959, but a third greater than the 320 lbs. of 1946.

A number of expert studies of long range demand trends have been made in recent years, with the Weyerhaeuser-sponsored Stanford report in 1954 being the first. The Department of Commerce, Forest Service, FAO and individual economists such as Dr. Louis Stevenson, as well as those forecasters in individual companies, have been looking into the future.

The best estimates of per capita consumption of paper and paperboard that I can find for the years ahead are as follows: 1965–470 lbs., 1970–510 lbs., 1975 – 540 lbs. In other words, total consumption growing from around 39 million tons in 1960 to 64 million tons by 1975. As George Amidon said a year ago, "Our association and all its members will have a tremendous job ahead in feeding this giant industry."

Apparent consumption per capita is a useful tool for measuring past and future growth trends, but because of large imports of newsprint, it is better for some purposes to consider only actual production of paper and board in U. S. mills. So, if some of these figures sound different, it is because they are production, not apparent consumption.

34.2 million tons is estimated production of paper and board in U.S. mills in 1960, a new record but less than 1% ahead of 1959 and well below the long-term growth rate of around 4% per year.

Growth rate figures, of course, represent long-term averages and yearly data may fluctuate widely. But keeping in mind this long-term figure of about 4% per year, what has happened over the shorter period of 1955 to 1960? Here are the average annual compounded growth rates for these last 5 years:

Total paper and board, plus 2.6% per year; Paper, plus 3.5%; Paperboard, plus 2.3%; Building Paper and Board, minus 0.3%. In individual grades are even wider variations, with sharp gains in some of the sanitary tissues and machine coated papers but declines in some other papers.

What appears to be ahead for the next year or two? Dr. Louis Stevenson's latest forecast of 1961 production for paper and board calls for a continued very modest growth rate to 34.8 million tons. The Department of Commerce experts predict 35 million tons in 1961. The forecasters look for continued growth to 37.5 million tons by 1963 and close to 41 million tons by 1965. These figures come to an average annual growth rate of about 3% a year, which since it is below our industry's long term average growth rate of 4%, may lead some to consider the forecasts conservative. I sincerely hope they are on the low side.

Now, turning our attention to growth in U.S. capacity of pulp, paper and board, we see that U.S. paper and board producers have doubled capacity about every 15 years since the turn of the century, with the exception of the depression period of the 1930's.

At the end of 1961, U.S. paper and board capacity of 40.5 million tons will be almost exactly double that of 1946–just 15 years ago. Of interest is that total U.S. pulp capacity at the end of 1961 will be 2½ times greater than 1946.

How much has all this cost? The best figures are those of the Department of Commerce and S.E.C. who report that the pulp, paper and allied products industry will have invested nearly $8 billion on expansion and modernization between 1946 and the end of 1961. Over half of this, or $4.2 billion, will have been spent in the most recent years since 1956.

Further growth in capacity is indicated by the latest APPA survey –42.1 million tons by the end of 1963.

In the past five years our industry has been adding to capacity at an average annual rate of close to 5%. Production has only grown at about 2½% per year in the same period. The disparity between these two figures is the basic reason for some of the industry's most challenging problems today.

This steady build-up of capacity in excess of demand levels has led to a decline in operating rates, particularly in the last half of 1960. For the full calendar year of 1960 the domestic paper and paperboard industry averaged about 88% of 6-day capacity, compared to 91% in 1959.

This decline in operating rates led to the most intense competition of the post-war era. This aggressive competition, in turn, has restrained needed price increases to compensate for rising labor, freight and material costs. In fact, lower prices have resulted for some grades of pulp and paper.

Inevitably, the price squeeze has led to lower profits. As an illustration, consider what has happened to industry earnings since 1956. Profits in 1956 reached a peak of $658 million (6.4% of $10.2 billion sales). Estimated 1960 profits of $595 million on $11.8 billion sales yield a ratio of only 5.0%, the lowest return on sales since the 1958 recession. In other words, industry sales since 1956 have increased by over $1.5 billion, but profits after taxes in 1960 will be at least $60 million less than they were five years ago.

It is quickly evident that the return on the tremendous new investment of our industry has not been satisfactory if judged by the figures above.

What about adequate profits and return on investment? Howard Whitaker's talk to the SAPI meeting in the fall of 1960 dealt forthrightly with the major problem of improving

industry profits and return on investment. James Miller of the investment house of Blyth & Co. presented an equally stimulating talk to a meeting of PIMA in San Francisco last June.

It is clearly evident that even with a good strong production growth in the next few years, this industry of ours will have to learn to live with operating ratios somewhat below the 91% average of the postwar period of 1946-60.

As an industry we face a highly competitive period during the next three years. It does not seem likely that the industry will in the foreseeable future return to the high operating rates that prevailed in the early 1950's. Applying Dr. Stevenson's demand forecasts to the APPA capacity figures mentioned earlier, we can project total industry operating ratios in range of 86% to 89% for the years 1961-63.

Based on industry profit experience of the past few years, it seems that a 6 point change in operating ratios (from 91% to 85%) can make the difference between acceptable and unsatisfactory financial results. Does this mean that we are in for unsatisfactory profits for the next three years if operating ratios don't exceed 90%? I can't answer that question, but the inference to be drawn from past experience seems clear, unless we do something about it.

Other factors have affected industry earnings and return on investment in addition to operating rates and lower returns per dollar of sales. Consider what these years of intensified competition have done to investment requirements:

First, competition has brought higher investment costs in new paper machines and associated equipment, as companies have installed not only wider and faster machines, but those that are more flexible from a grade standpoint.

Second, competition has forced more investment in facilities to improve delivery service such as automated order processing, branch warehousing, new offices, etc. Competition has also pushed companies into broader lines of product with increased investment requirements in many types of specialized equipment.

Furthermore, increased investment has been required of many companies to meet state and federal regulations governing water and air pollution.

How have these expenditures influenced return on investment? The turnover factor has been held down because the investment per dollar of sales has continued to increase while prices (in the numerator of the fraction as an element of sales) have been kept down by competitive conditions.

What can practical businessmen do living in the realities of a competitive world, about this serious problem of adequate profits?

First of all, it is my conviction that in the future, as in the past, certain grades of paper and board will fare better than others as market needs change. Those companies who are successful in identifying these needs in advance and who realistically plan and install capacity to meet these *needs*, will enjoy better operating ratios than those averages I referred to earlier. They will likewise enjoy better profit margins and returns on their investment.

The recommendations of others in the industry who have spoken out seem to be along these lines:

Reduce costs in manufacturing, distribution and marketing. Closely allied is modernization of existing equipment.

Eliminate products that are known to be heavy losers and a drain on profits.

Adopt realistic, as well as competitive, pricing policies. Excess capacity available in the industry will no longer allow the newcomer in a sector to "buy his way into the market" without destroying the total price structure.

Spend the necessary time and effort to more accurately project the optimum timing of major new capacity expansion programs. This means that we must find and use the best brains both within and without the industry to make studies of long-range demand levels and our own companies' relation to the present market and future needs.

If this industry is to meet demands for at least 50 million tons of production of paper and board by 1970, it will take enormous amounts of capital in the last half of this decade. The current profits challenge must be met and the industry must prove that it can make capital investments pay off, if we are to maintain the confidence of thousands of investors.

What of other long-range trends of the pulp and paper industry?

First, is the trend toward increasing competition from other industries.

Apart from the steadily increasing tempo of competition from companies within the paper industry, the last few years have seen steady expansion of plastics into markets traditionally served by paper and board. Thus far much of this new competition has been centered in packaging applications, but who can dare say that plastics substitutes won't ever be developed for cultural and business papers?

At a TAPPI Plastics-Paper Conference held in Syracuse last fall, the growing importance of paper and plastic combinations was stressed. These include coatings, laminates, impregnations and such. The consensus of this meeting was that paper can no longer rest on its laurels as a low cost substrate.

With resin costs continuing to decrease as the volume of plastics increases, the plastics and foams are gaining on traditional papers. The real threat is that, while plastics costs go down, paper costs seem to keep going up. Paper people who still consider their product an irreplaceable entity or an art form had better begin thinking about tailoring that product to the packaging times, about taking earnest measure of paper and plastic combinations.

What are two of the most basic economic trends affecting the future of the pulp, paper and board industry?

First, are population trends Almost everyone is familiar with the forecasts of growth of U.S. population that have been rather widely quoted in recent years. If current trends continue, total population should reach 196 million by 1965 and 214 million by 1970 compared to the 180 million reported in 1960. This factor alone will have an important influence on paper and board demand, but there are also some other, less obvious aspects of this population growth that are important to us.

Don't forget that the working age, marrying age, buying age population of the 1960's is already born. During the first half of the decade there will be very rapid gains in teen-age population and those people from 20 to 24 who are seeking jobs and usually newlymarried. The very important and large population age groups between 25 and 49 who are the heaviest spenders on homes and durable goods will not increase much between 1960 and 1965. This fact alone will have an important bearing on the demand for many products, including paper and board, during the next five years.

On the other hand, the trend toward larger families at younger ages for parents and the growing number of working mothers will favorably influence demand for many kinds of paper and board products. In other words, what additional "built-in maid services" can the paper industry supply American women? The answers we

come up with will have a direct bearing on our future growth.

Second, are income trends Disposable income (that left after providing for taxes) is expected to influence consumer spending patterns. Compared to 20 or 30 years ago, many paper products have approached the status of necessities rather than luxuries, as income levels have risen. However, as current products have approached saturation use levels, future growth will more closely parallel normal income and population trends. The new products and new markets for paper and board must be developed on a continuous basis.

This leads to our final basic consideration. What are the conditions that must inevitably underlie future growth in the pulp and paper industry?

In the first place, we must have research programs (of both the R&D, marketing and economic variety) that will be successful in finding new products, uses and markets for paper and board.

Secondly, we must develop these future markets so that they will be large enough to offset both the effects of losses of specific markets (from plastics, for example) and the possible saturation of markets for some existing types of paper.

Is the pulp and paper industry carrying on enough of the R&D kind of research, as well as marketing and economic research to meet these two conditions of growth? Last year at the general metings of APPA, Dr. Alfred Nissan presented a good analysis of

Intensive Training Needed

to apply sound business and scientific principles

"*What Type of Woodlands Organizations Will Be Required to Meet Future Industry Demands?*"—T. T. Dunn, Vice Pres., Union Bag-Camp Paper Corp.

IN THINKING of the problem of woodlands organizations and future industry demands I was struck by the implication that our present woodlands organization will have to undergo changes to meet anticipated future conditions. Changes in the whole scope of woodlands activities are bound to come, and the organizations charged with meeting the challenge presented by the "new frontiers" (apologies to President Kennedy) must be strong enough and flexible enough to cope with the then current conditions.

It is unnecessary to elaborate on the many forecasts that are being made concerning increased demand for pulpwood because of an expanding per capita consumption by an expanding population, or to elaborate on the shrinking amount of commercial timberlands that will be available owing to increases in requirements for rights of way, recreation and urban expansion.

It is also not necessary to dwell on the increased importance of controlling this most costly of our raw materials in the profit squeeze in which we now find ourselves and which is certain to remain a part of the woodlands world of tomorrow as we seek to increase our own effectiveness and meet the challenge of those other industries that covet certain segments of our markets.

To plan for the future it is well to examine the past. Going back some 30 years in the South, my own experience has been in the Deep South (beginning with the old Great

DUNN

Southern Lumber Co. in Bogalusa, which was, by the way, one of the first companies to seriously practice reforestation) the average woodlands organization for a pulp mill operated under the following conditions.

Land ownership was relatively small and land acquisition was just beginning to be intensified. Investment in land was very modest by today's standard, and was generally handled by men considered to be good horse traders skilled in talking to the farmers and backwoodsmen who owned the forests, and who could hardly make a mistake in any land purchases, considering the enhancement in value that has taken place since that time.

Forestry practices were confined almost entirely to some fire protection and general custodial operations with very few graduate or even trained foresters working in industrial forests and little or no forest research being attempted by industry, and with very little recognition of technical details such as variation in pulp yield with different species and sizes of wood.

Procurement of pulpwood was confined to the purchase of round pulpwood, with 90% to 95% of it purchased from privately owned lands. Tools for harvesting consisted of an ax, crosscut saw and a bobtail truck.

Since wood was available and relatively cheap, there was little reason to operate differently.

Striking changes have occurred as the paper industry has grown and the need for owning land to properly support the industry became evident. The various companies wisely decided that to protect the tremendous capital investment in plant, sufficient woodlands must be owned or at least controlled to assure continuous operation.

Today most of the mills in the South confidently look forward to the time 10 or 20 years from now when 50% or more of their requirements could, if necessary, be harvested from their own forests. Timberland has become so expensive that we must obtain the maximum yield from each acre of land and to do this it is necessary to employ trained foresters to protect and cultivate the timber crop, to plan, prescribe and carry out harvesting and regeneration policies.

Wood procurement has not, in my

this question. One of his conclusions was that the industry lacks enough revolutionarily minded scientists. Isn't it a fact that the amount of money spent on research is not the sole criterion of its effectiveness, but the amount of creative, truly productive thinking that is going on? Furthermore, you don't necessarily have to work in a laboratory with test tubes to be research minded and creative. We need new ideas for better woodlands management, better and cheaper distribution, as well as new products.

FOREST POLICY FORUM – Kimberly

How to unleash creative potential of the thousands of intelligent, highly trained men and women in the paper industry is the real challenge. Perhaps an even greater challenge is how to systematically and effectively channel their creative energies toward the new markets, new products, new investments and better ways of doing things that will be needed in the years ahead.

It all really boils down to the inescapable fact that trained, creative people at all levels—not woodlands, not buildings, not machinery, are the most important and irreplaceable assets of this industry. How effectively the talents of these people are employed will do more than any other factor to determine the operating rates and profits of your company and mine in the sixties. ■

opinion, kept pace with the progress that has been made in the management of our forests, but here, too, we are beginning to see some slight improvement in the harvesting and handling of pulpwood. At least we have reached the point where it is generally recognized that our present methods of felling, bucking and loading are extremely inefficient and steps are under way to bring about improvement in this area.

Research, too, has come into being with studies being started on many phases of genetics, disease control, growth, etc. Most companies have research programs of their own and many others are taking an active part in cooperative research projects with various forestry schools and governmental laboratories.

Obviously, profound changes have taken place in the last thirty years, but there is no reason to think that we have come to a stopping point. Quite to the contrary, it is evident that we are in for even greater changes in the next three generations than we have experienced in the last three. It is quite evident that we have now reached what might be called a point of departure into many new and important areas, and the progress and development that will take place in the near future will require changes in our woodlands organization. These organizations will need to be intelligent, progressive and flexible to handle what could very easily be the most important single management area in our industry complex.

LAND ACQUISITION

The purchase of land for pulpwood must compete with every other corporate need for money. Therefore, sound economic judgment must be exercised in any acquisition program. This requires an accurate appraisal of the present stocking of the land, expert knowledge of the soils, the ability to judge time and cost to make idle lands productive, the fringe benefits that might accrue from other products, the accessibility and long-term freight situation, and last but not least, the tax situation now and tomorrow and tomorrow.

MACHINE planting is one of the major methods of assuring continuous forest production.

Because of the compounding effect of the investment involved, a profile of the year by year development of the land is essential. Corporate management depends on the woodlands organization for accuracy and total company thinking in this important field, which certainly is much more complex than the hit or miss methods that sufficed yesterday.

LAND MANAGEMENT

Although many companies purchased their timberlands when prices were only a fraction of what they are today, it is nevertheless true that in today's market a woodlands acre represents a sizable investment. Taken collectively, the acres owned by any individual company might very well represent an investment that equals or exceeds the investment in a single plant.

Because these woodlands are needed as insurance against a shortage of raw material for the mill, it would seem to me to be unwise for any company to sell its woodlands, even though a considerable profit can probably be made. Therefore, this invest-

ment in woodlands which has now reached very important proportions, must be continued, and the owning of these woodlands will prove to be an unprofitable investment unless the optimum yield in dollars is obtained from each acre. It is simply good business that our woodlands must produce the maximum income.

It does not matter what title you use to describe the man who calls the shots in your forest management. The important thing is that this man combine an almost incredible array of talents, not the least of which is financial management.

Consider first the investment that is represented by the value of these timberlands today and add to it the cost of operating the forest for maximum production, ponder the long-range decisions that will be made on his judgment in the area of silviculture covering a long rotation period, remember the need of the public for recreational use of the lands, consider taxes and public relations, give some thought to the management of men and machines and methods and when all this is put together, you have a prescription for the man who should be managing your forests. This sounds like more than one man and it is—it's foresters, wood pathologists, entomologists, engineers, financial men, and above all, men who understand the total corporate picture.

WOOD PROCUREMENT

Possibly, the procurement of raw materials is to experience more changes from the present than any other woodlands operation. Supply and demand, cost, and possibly legal restrictions will force more attention to this neglected area. Within the past few years, we have seen the development of mechanized woodyards, special railroad facilities to improve delivery of wood, purchasing by weight, chip procurement, slab utilization and the meager beginnings of harvesting mechanization.

We will see development of more and more semi-automatic methods, some automation, better planting for future harvesting, leveling of production as a result of linear programming studies, computer analysis of pulpwood production, and operations research techniques applied to the whole procurement economics of pulpwood inventories in order to provide means for management decision making in these areas.

So what kind of men do we need in the procurement organization? Certainly men who are skilled in purchasing, logging engineers, industrial engineers, analysts who are capable of programming analytical studies and interpreting the results, and above all, men in key positions who have flexibility, depth of thinking, sound judgment and good business sense.

RESEARCH ACTIVITIES

At present, the amount of money that is being spent by the various companies in the industry on forest research is relatively small and yet research is in reality the keystone to firm progress in the production of wood fiber. The importance of producing the maximum amount of wood fiber per acre in the least possible time is becoming more and more evident as we see the encroachment being made by synthetics and plastics into fields historically called ours.

The cost of woodpulp has shown a steady rise primarily because of the cost of the wood itself. The cost of the substitute materials mentioned previously has been going down. Unless we are able to find ways and means of growing, harvesting and transporting to our various mills wood fiber at a lesser cost than we are doing today, or in any event, at a cost that is not continually rising, then I am afraid that the competition that we have seen up to now will fade into insignificance compared to the competition that we

Public Relations Success

depends on action, achievement, confidence of the public

"What is the Relationship of Woodlands Organization to Corporate Public Relations?"
—John L. Tower, Vice Pres., International Paper Co.

AS A PUBLIC RELATIONS practitioner, I am particularly pleased that one spot in this panel was reserved for public relations—this phase of overall corporate activities has not always been taken into account in this way. In fact, my guess is that ten years ago such a panel very likely would not have included a spokesman for the public relations responsibilities of the woodlands organization.

Before I attempt to pin down the job, let me borrow from a speech made several years ago by Earl Newsom, whose public relations firm has served International Paper for a good many years as our consultant in these matters. In defining the elements of a good public relations program, Mr. Newsom made five points which I think are pertinent to this discussion.

TOWER

Here are his five yardsticks

1. People must feel that the individual or institution . . . wants the kind of things they want. He briefed this idea as "going our way."

2. People must feel that this individual or institution is taking initiative—"taking positive action."

3. People must feel that this institution is made up of the kind of human beings they like and admire. It is not a cold, impersonal institution, but a fine crowd of fine people. You might refer to that as "my kind of people."

4. People must get the impression that the institution is proceeding hopefully. Here is the "promise of achievement."

5. Finally, people must feel that this institution has its eye on the fu-

will have outside of our own industry.

A great deal more knowledge is needed both in the basic and applied fields if we are to grow and harvest tree crops in the surest way. We must strive to learn methods of growing more and better fiber in less time, the use of a greater number of species and the use of every part of the tree. At best, forestry research is painfully slow, as is silviculture because of the growth habits of trees, the length of rotation and the vicissitudes of nature.

In the field of forest genetics alone, the possibility for improved wood characteristics and yield is fantastic. We as an industry must capitalize on all such possibilities if we are to compete in this technological age. The desperately needed information which we must have to enable us to do so will come only from research.

Other areas of importance to be considered in setting up our future woodlands organization may or may not be connected to the traditional woodlands departments of acquisition, forest management and procurement.

It is imperative that all woodlands managers recognize the increasing importance of public relations as industry ownership of lands increase. Our increasing population with more leisure time and higher income will mean increased demands for the recreational use of all forest lands. Our lands will certainly share in this pressure. Woodlands organizations must take this into account in long-range planning and adopt positive plans to handle this changing situation.

Recreational use of our forest lands can be a wonderful public relations tool or it can be a matter of grave concern or irritation, depending upon the policies we adopt. There is one thing certain—this problem cannot be ignored. Somewhere in the organization there must be one or more persons who give constructive thought to this problem, whether on a full-time or a part-time basis. I think the time is coming when every company with sizable forest lands will need to have someone full time in this area.

Because of its importance, one thing deserves mentioning again, and that is the waste of fiber which we are now experiencing and which our woodlands organization must endeavor to eliminate.

We fail to use all of the trees that we harvest, we leave many species of trees in the woods because the mills find it inconvenient or have not learned how to use them. Millions of cords of wood are lost annually to wild fires, insects, and tree diseases.

Progress in reducing this waste is beginning to improve, but we must have an organization that can speed up this reduction. Our future woodlands organization must be strong enough and progressive enough and backed up enough by top management to convince mill operators of the economic need to use sizes and species that do not meet today's specifications.

In summary, I will not presume to tell you what form your woodlands organization should take. The important thing will be the people, the men whose names fill the little boxes on the organization charts. These men must be experienced in their various fields of endeavor—land acquisition, land management, wood procurement, industrial engineering, entomology, forestry pathology, public relations, financial accounting and above all, business management, men who can be trusted to administer efficiently a multi-million dollar enterprise which our woodlands have become and who possess all of the qualifications needed for eventual advancement to top positions within the corporation. ■

ture. Brief this element by the phrase: "Toward a better world tomorrow."

I don't believe it is necessary for me to argue that these elements of a public relations program are desirable. The pulp and paper industry has learned over the years that public opinion does matter, that it is easier for companies to perform their complex functions these days in an atmosphere of general public understanding and approval.

Perhaps this is particularly true of our industry—but I think in general that any large industry and the individual companies in the industry recognize the necessity of working toward a good business climate. In our case this may be in terms of specific approval of our policies and programs as large landowners or simply a general feeling that our industry is a good employer and a good neighbor to have in a community.

I guess the next question is—how are we doing? Well not many months ago the Southern Pulpwood Conservation Assn. had a pretty impressive study made of public attitudes toward the industry in the southeast, midsouth and southwest regions, eleven states in all. The survey concluded that the opinion climate in which the Southern industry operates is basically a favorable one. They said: "The challenge confronting the industry is not primarily the counteraction of adverse opinion; rather it is overcoming the widespread lack of knowledge of the industry and the misinformation regarding it."

Very little emotional response to the industry was indicated by our analysis of the survey. Practically no one said that it is good to have a paper company in town because they are good companies run by good people—they gave economic reasons.

But here is the rough part. Only 6% of those interviewed thought they knew very much about our industry; 59% could not think of the name of a single pulp and paper company. When they were asked to say generally whether their impressions of the industry were very favorable, fairly favorable or not very favorable—43% said very favorable, 23% said fairly favorable, only 6% said not very favorable, but a whopping 28% could not think up any impression at all.

That vacuum of public opinion spells potential trouble for the industry—and that is the context in which I want to make my remarks.

The forestry organizations of the pulp and paper industry provide a unique corporate asset in this field of public relations. But the results of this most recent public opinion survey indicate that there is a whale of a lot more to be done—at least in the South.

Our problem in public relations, when we are dealing with matters of opinion, is to find some way in which we can convey to people whose attitudes are important to us an understanding of the things we know and believe. There are many ways in which we try to do these things. Some are pretty effective; some we are not so sure of.

One thing that I believe most people in public relations work would agree on is this—when it is necessary to change a person's attitude, or create an attitude, it is often easier and more satisfactory if that person can be met and talked to face-to-face. If, through such personal contact, a question can somehow become a part of a man's own personal experience, if he can see and touch and study for himself, if he can have an opportunity somehow to identify his own personal interests with the ideas that are being presented to him, public relations is much more likely to succeed.

Attitudes are seldom changed simply by providing statements of facts. We sometimes assume that if we can somehow get all the facts to the people, they will automatically see things just the way we see them. But the disconcerting truth is that when facts alone are presented, the effect very often is to reinforce a belief already held that may seem to us to be completely contrary to these facts. It is the interpretation of facts which matters.

A good many educational programs seem to have foundered on an overconfidence in "the facts."

A man who has seen for himself, on the other hand, becomes a part of something. He has had an experience. He looks at facts with a fresh eye. He may very well persuade himself that he has always believed just what you had been trying to persuade him to believe.

Here's where the forestry organization of pulp and paper companies can become the unique corporate asset I believe they are.

First of all, where are they? Well, we all know they are scattered all over the countryside in every one of the wood producing areas of the United States. They are not concentrated in New York or other corporate headquarters, as your formal public relations battalions are apt to be. They are in the field, meeting people, advising people, helping people, buying from people—every day.

"My kind of people" was the phrase used by Earl Newsom. I would suggest that for millions of people all over the country, "my kind of people" are not popularly thought to be the people sitting in corporate headquarters back in New York—my kind of people are the people I know and see and work with every day.

I have no idea how many different communities in the United States have some kind of daily personal contact with one of our woodland representatives. The number would run into the thousands, I am sure. In many of these communities there are regional or district woods offices or perhaps even pulpwood concentration yards or maybe one of our foresters simply makes his home there. No matter, the industry becomes a part of that community.

FORESTERS CONSTITUTE IMPORTANT ARM of the public relations activities of forest industries firms; author says greater effort needed.

In that community the company is not remote and inaccessible. That is, it is not remote and inaccessible if it is smart enough to see to it that their local people really think of themselves as total representatives of the company, in other words, public relations representatives in the broadest sense.

Focal points for the industry in its efforts to create a favorable climate of public opinion should be these communities. The men who are in charge of these operations must realize that they have a primary public relations responsibility—that they are the paper industry and their company in these communities—that people in these communities will tend to judge their companies by the men they know, and judge the work of the companies by what they see.

We believe that the paper industry, faced as it is with some important problems in the field of public opinion, has a unique opportunity to develop each of these communities into a strongpoint of support for the industry. This can be done, it should not be expensive, but it needs understanding of the opportunity, a solid backlog of information available to the local men and the enthusiastic participation of the men on the spot.

Just to get the ball rolling, let me talk about one important area of community opinion.

Members of each state legislature are particularly important to our industry, concerned as we are over questions involved in land ownership, so they make a good starting point. Of course, dealing with public officials may raise questions of company policy. Policies must be clearly stated and understood and controls must be established.

Now wouldn't it be a good idea if every state legislator from a wood-producing region sometime during the next year had an opportunity to see for himself just what the paper industry does for his constituency.

If I were a legislator I would want to know the people who were responsible for managing forest lands in my area. I would want to

know how they work with small landowners and farmers, what services they offer to these small timber owners, how they protect their own land and what help they are able to offer other citizens in protecting their land. I would be curious to see some of the new mechanical equipment in operation and if there was a mechanized wood concentration yard in my area, I would certainly appreciate an opportunity to inspect it. Assuming I was also a sportsman, I would be interested in their game management program and their policies regarding public hunting, fishing and other recreational uses of the land.

After I had made these visits and gotten to know the local men, if the manager of a paper mill 50 or 100 miles away invited me to visit the mill one day as his guest to see for myself how the wood from my community is made into paper, I think I would want to go. And I think, assuming these visits were handled with tact and efficiency, that I would go away very favorably impressed with the character of the people I had met and enthusiastic over the contribution they are making to the economy of my community.

Legislators are people—so are bankers and newspaper editors and merchants and teachers. People have a natural tendency to be proud of the things that are part of their daily lives. A big corporation with headquarters in New York hardly seems to be part of the daily life of a storekeeper in a small Mississippi town. But a wood procurement office on the edge of town, run by a young fellow who lives on the next block and whose kids go to school with the storekeeper's children can be a part of that storekeeper's life—if he is given an opportunity to see it in his own terms and understand it and identify it with the interest of his community and his friends and his family.

This kind of grassroots work is being done by many companies in the industry. They have accomplished wonders in putting across the idea that trees are a crop, that good forest management will pay off for any landowner and they are making progress in your battle to make people understand the threat of wildfires.

But I think there is important evidence to question whether there exists that process of identification of interests between the public and our industry that must be achieved before we can have the widespread favorable public attitudes we need.

Perhaps that one example will serve to indicate the kind of role in corporate public relations I visualize for the woodlands organizations. I think the men in these woodland organizations are ideally suited to make a reality of the five yardsticks mentioned by Earl Newsom. I think there is also a role, an important role, for the thousands of independent businessmen who serve our industry as pulpwood producers and contractors. They are men of substance and influence in their communities.

Our job as corporate managers (more particularly those of us who have been assigned responsibilities in the field of public relations) must be to make these yardsticks clear in terms of company policies and programs. In our own company, I have never encountered anything but an enthusiastic response to well-thought-of suggestions for expanding the public relations role of our woodlands people.

I have been talking about work at the grassroots level because that has been my assignment. Let me just mention the very good work in this same field that is being done by the industry's public relations arm—the American Forest Products Industries (AFPI). The AFPI is geared to tell the industry's story on a nationwide basis. Their work in metropolitan areas can back up our companies' grassroots effort. They are also set up now to reach a new and very vocal audience, the ladies of the nation, particularly those in organized women's groups. And remember the AFPI staff is continually producing materials of all kinds in these areas, which our people can use for background or for distribution.

There are plenty of things for us to worry about. For example, we are going to be worried over the years ahead about the increasing competition for land, and the pressure on existing commercial forest acreage. We are going to be worried, as we have been in the past, about improving the forestry practices on small forest holdings. We are certainly going to be thinking a great deal about the increasing pressure for outdoor recreational opportunities and the effects of this pressure on large landowners, and as the nation's need for water grows every year, we are going to be more and more concerned with the function of forest lands in improving watersheds.

These are the questions that are going to be pressing on us all—at the top management levels. The answers that are developed to these problems are going to affect the future of every company in the industry.

But these are also questions of public policy and they are questions that will ultimately be answered by public opinion. Will it be an informed public opinion that gives the answers or will it be public opinion that is led by slogans and emotional appeals with a "soak the rich" flavor.

We can have quite a lot to say about these things. First, we need to make sure that we understand these questions and that the answers—answers framed with responsible consideration of every aspect of these complex problems—are solidly based and truly in the public interest.

Once we have thought our way through these problems, the next step is really easy. If the answers are compatible with the five yardsticks of good public relations I mentioned earlier—and if they are the right answers, they will be compatible—our job is to see to it that all of our people know the answers and the thinking behind them.

From that point the kind of resourceful people who have established the idea that "Trees are a Crop" and who are doing such a fine job in building support for the industry's fight against forest fires can take over. They know how to deal with the people of these woodlands communities for they are that kind of people themselves.

They will be bringing a story to these communities that is in line with the objectives and aspiration of these communities—they are "going their way." They will be taking initiative. They will be proceeding hopefully, because if we are not hopeful, honestly hopeful, we might just as well give up.

Finally, we are looking toward the future, toward a better world tomorrow. We are talking about more jobs, more income, more production for these communities, just as we were when we brought them the message that trees can be grown as a cash crop.

It all seems very clear to me. We have our problems, true, but they are problems for which there are logical answers—answers in the public interest. Using this immensely valuable corporate asset, our corps of trained foresters and wood procurement men can communicate these answers to the people who have the most to gain, and our industry can build a tremendous backlog of support where we need it most—in the timber growing communities that ultimately are the basic support of our industry. ■

Pulpwood Cost Reduction

keyed to technology, firmer field-management understanding

"What are the Long-Range Relationships of Pulpwood Costs to the Rate of Return on Products Produced?"—J. W. McSwiney, Vice Pres., The Mead Corp.

McSWINEY

PULPWOOD COSTS are all costs necessary to deliver pulpwood to the mill yard, including that part of land management costs necessary for current pulpwood production. "Rate of return on products produced" refers to net profits after taxes expressed as a percentage of invested capital.

Before we proceed to our subject, let's look at the overall industry. Let's examine the record as to the rate of return on products produced by pulp and paper over the last several years. During the 1946-1958 period, the pulp and paper industry increased total assets by approximately $4½ billion. Net profits after taxes, however, in 1958 were $357 million, or $44 million less than 1947. The average for this period was $348 million. The net effect of this is that the return on investment is now about 60% of the level attained 10 or 15 years ago. (Source APPA Capital Income Survey 1939-1958.)

Let's also talk about the components of pulpwood costs—stumpage, labor and transportation, and see what has happened in this area.

(1) Roughly speaking, in both the South and West, the cost of stumpage has about tripled since 1946.

(2) At best we can say that the mechanization of pulpwood harvesting has advanced sufficiently to offset increased labor rates, so that the per unit cost of production has maintained a plateau during the fifties.

(3) The cost of rail transportation has about doubled since 1946. However, where concentrated efforts to increase pulpwood receipts by trucks from nearby sources have been effected, the overall transportation cost increase has been less severe.

A straight-line projection of the trends of these combined component costs of pulpwood would indicate that costs would over the long-range substantially reduce the rate of return on products produced. Of course, a straight-line extension of these trends is not realistic as the lines would of necessity flatten out when the return on investment in the pulp and paper industry approached bond and interest rates, as there would be no incentive to attract capital into the industry.

Next, we should make some assumptions as to the long-range relationship of pulp and paper products to their competition. I believe this relationship will be determined by the utilitarian or diverse needs which the pulp and paper products serve and the attendant cost in relation to competitive products. As a result of the new higher level of efforts being exerted in the industry, it should maintain qualitative characteristics such as stiffness, rigidity, disposability and attractiveness inherent in today's pulp and paper products and add or enhance others such as transparency or opacity, liquid repellency or absorbency, bulk and so forth.

In other words, I believe it can be safely assumed that paper and paperboard will continue to be products which the consuming public will want in increasing quantities. Overall costs, therefore, will be determinative of whether pulp and paper products will maintain their current competitive advantage.

It is well to consider the possibility that a portion of pulp and paper products in the not too distant future may be substantially enhanced in value by chemical modification of cellulose fibres. If this is accomplished, then the resulting product may have a value greater than competing plastics because of the resulting new dual qualities. This would be an important factor in the relationship of pulpwood costs to return on products produced.

Opportunities for Reducing Costs in its operating facilities are being explored by the paper industry—and in many instances well developed blueprints of how this will be done are at hand. It is true that in many cases the proposed cost reduction will be brought about by capital investment of a rather substantial nature.

Aside from tree farming, I do not sense the same concentrated attack by those in the woods end of the business. Is this because there is a feeling that substantial capital expenditures, if required to reduce pulpwood costs, will not receive management approval?

I hope these background comments have for the moment focussed our attention on the total industry as well as that segment with which we are dealing. And I hope you perceive and agree with me that the most important consideration with which each company in the industry is faced is attaining and maintaining a proper level of return on its total investment irrespective of any individual component of overall costs, but that pulpwood costs offer a most productive area of opportunity. I submit that in achieving this goal, constant and ever-increasing attention must be given to:

(1) An all-out attack on costs at every level.

(2) An analysis as to the competitive value of pulp and paper products in relation to competitive materials and pricing them accordingly.

Many analysts and economists have pointed out that profit margins in the paper and pulp industry are too low and that cutthroat competition and over-capacity may seriously undermine the ability of individual companies to keep up with the competitive pressure for new products through the lessening of a fair return on invested capital.

But I do not think that the industry's over-capacity has any bearing upon any individual company's ability to maintain effective supervision of its manufacturing costs, or its ability to determine the true value of its product. Some may feel that the sales price of your company's products does not concern you, but I assure you it does, and a fair price is the first requisite of a sound business.

To appraise its pulpwood costs realistically is a problem which must be met by any company with an attack as direct as any attack on manufacturing costs within an operating plant and calls for the same careful analytic approach.

First, stumpage. We might ask the question, what determines the true value of stumpage—and the price you are willing to pay for it? Generally speaking, in our American system of enterprise, we expect a return relative to the risk of the capital employed.

In considering the value of stumpage, the question is, what is the relative risk involved in owning and managing open market timber holdings, and where does this fit in the scale of return on investment in our American system.

Today the return on investment of substantial timber holdings in the South approximates, and in some cases exceeds, the return on investment in plant facilities. The relative risk and the detailed management required to produce pulpwood on these timberlands can be compared with that required for manufacturing facilities.

The determining factor is the rate of return necessary under efficient land management practices on open market lands to induce owners to produce pulpwood for sale. This in the long run must determine the true value of pulpwood and what you ought to pay for it.

In the South over 1,500,000 acres of land are being planted each year. If we assume these to be well prepared plantation type acres and that the productivity of these newly planted lands would be increased by ¾ cords per acre per year, then each year will see the bringing into being for future use, the requirements of the equivalent of approximately eight new 300-ton per day mills. I submit this is a factor relating to the value of pulpwood stumpage—today and long-range. Some recent estimates have put the country's requirements at 300 such new mills by the year 2000.

On the foregoing assumption of increased productivity of new plantation type acres, the nation's increased pulpwood requirements could conceivably be provided from the increased productivity of Southern lands. If this could be achieved, would it not remove some of what I term the present "over-apprehensiveness" as to the adequacy of pulpwood supplies of some members of our industry.

Next, labor as a component cost of pulpwood. In the Southeast in 1951 when woods labor was about 70¢ an hour, a recent APA survey indicated that about 90 cords was produced per man-day, which would figure out on an 8-hour day basis at $6.30 per cord.

In 1960, using labor rates of about $1.10 per hour and the production of about 1.35 cords per day, we come out with a total cost of about $6.50 per cord. Allowing for error in these figures it would seem a plateau has been maintained in the fifties as far as the cost of woods labor per cord of pulpwood produced in the southeast.

Figures published by the Lumbermen's Industrial Relations Council in Portland and Seattle, Wash., and published under the caption "Logging Lumber Facts," indicates that about a plateau of labor costs has been maintained in the Northwest during the fifties. Both plateaus were reached after a steady rise in the forties.

Now, if labor costs are to be maintained or reduced, some way of achieving this must be devised. I am inclined to think that regardless of the type of automation developed for harvesting timber over the coming years (you will note I am assuming the development of automated or semi-automated harvesting, the controlling factor will be the volume per acre available for harvest.

In the South, for instance, if the volume available for harvest is to be increased, then plantation type acres must be increased. To do this requires acceleration of land preparation and planting programs. There is, I believe, some reluctance to truly accelerate this work due to lack of knowledge as to how to do the job efficiently, and concern as to what portion of the cost is expense or capital.

The following example may help focus on the opportunity in this area. Total land preparation and planting costs in the southeast are currently running under $30 per acre. If this cost were spread over a production cycle of, say, 30 years, it would amount to approximately $1 per year, about the cost of a man-hour of woods labor in the Southeast. To offset this cost it is necessary only to reduce harvesting costs by one man-hour per cord, and in addition this would produce the advantages of:

(1) Increased yield per acre.
(2) Reduced transportation cost.
(3) Tailoring labor requirements to probable labor supply.

I believe over the next ten years it will be feasible, at a minimum, to cut man-hours per cord of pulpwood production by 50%. Today the man-hours used in producing a ton of pulp run about twice as much for producing the pulpwood as is the case for converting the pulpwood into pulp. Unquestionably then, there is a great opportunity for mechanizing pulpwood harvesting—and I believe a volume harvest is the key to this problem.

Minimizing the distance over which pulpwood must be hauled is more important to reducing transportation costs than rail rates, costs of trucks and truck driver rates. (For the record, however, it should be stated that the cost of rail transportation has risen from $1.71 to 128 cu. ft. cord in 1945 to $3.35 in 1960 for a 100 mile single line haul.) Cross-hauls, backhauls, and so forth do not represent a dollar benefit to any pulp and paper company.

There are several ways of getting at the reduction of transportation costs, some of which are going on today—swap of stumpage by mills, swap of land by mills—but even so there is much room for improvement.

Essentially a company must solve its transportation problem through a study of geography and transportation costs. As I see it, the mill's problem is to determine from what areas it should draw its pulpwood in relation to available stumpage in order to keep overall transportation charges at a minimum. This is the kind of study that can best be done by experts who have a thorough grasp of the economics of pulpwood procurement and transportation costs. There is no mill that would not benefit from making such a study, although I suppose the actual savings to each would vary.

Pulpwood costs represent a component offering great potential for achieving a satisfactory return on products produced. The job of controlling "pulpwood costs" is a job for men in this audience. Too often, I think, it is said that progress in the woods suffers because of a lack of understanding or support by "top management." I feel that a man in the woods who is not receiving the support of top management should question what he is taking to top management.

Generally speaking, top management wouldn't be where it is except for a proven ability to differentiate between good and bad ideas. If ideas in the woods are sound, they will be supported. In my experience, these ideas too often have not passed the tests that of necessity are applied to all segments of a business. You have a most fertile field. You will get the attention and respect the same as any other segment of the business if you command it. ■

DEER HUNTERS CREATE DEMAND for more recreation facilities every year.

MICHIGAN FOREST PARK is in an old white pine plantation (USFS photos).

Multiple Use Commitments

will necessitate more intensive cultivation, improved yields

HAVE WE ENOUGH LAND in this country to provide the resources we need to keep up our standard of living? Will the almost 2.3 billion acres which comprise the 50 states produce the food, the metal, the water, the wood, the living space and the playing space which our population will want to have in the next century? Every year decisions are being made, by design or by default, which affect the way these questions will be answered. And there is a special tug of war over the use to be made of publicly-owned land.

There will be enough land for living and for producing food, and for all the intensive uses which can support high per acre values for land. Our question, more specifically, is this—can priorities of land use be so arranged that enough land remains available to fill future needs for uses like wood production where there is presumed to be an upper limit on how high the land values may go. This more specific question relates not to all land, but to land now classed as wild land.

The Department of Agriculture estimates that some 21 million acres, of the 1.9 billion acres in the United States, exclusive of Alaska, are occupied by cities, towns, industrial sites and similar urban uses. The increase in urban areas from 1945 to 1954 was at an annual rate of almost 400,000 acres per year. If this rate continues, the acreage in urban areas could more than double by the year 2000.

***"Withdrawing of Commercial Forest Lands from Timber Production for Other Uses"*— Arthur W. Greeley, Assistant Chief, U.S. Forest Service.**

GREELEY

Rural transportation areas for highways, roads, railroads, and airports now embrace an estimated 24 million acres. From 1945 to 1954, increases in this class of use were at an annual rate of 76,000 acres. The 41,000 miles of the national defense highway system alone will require, when completed, over 1½ million acres for rights-of-way and access. By the year 2000 it is possible that as much as 30 billion acres could be occupied by rural transportation facilities.

Most crucial area of concern for the answer to our question is not in urban uses or transportation or power line usage but in the field of agricultural use. A report prepared in 1960 by the Dept. of Agriculture for the Senate Select Committee on Water Resources pointed out the possibility that as much as 73 million acres of forest land could be diverted to other agricultural uses, mostly crop or grassland agriculture.

Were such a shift to come about, the impact on forest production would be staggering. This report also points out, however, that there are many factors working in the opposite direction that cannot be adequately appraised.

Developments in farm technology, and future break-throughs in science, for instance, could have the effect of further materially reducing the cropland acreage needed to provide food

per 1,000 of population. Forest managers cannot count on this. They should, however, follow developments in agricultural research with real interest and real concern.

Trends such as these, together with the well-publicized periodic upward revisions of the nation's population forecasts, are causing many groups with an interest in how wild lands are used to try to assure that the future needs of their own group will be met.

Take duck hunters, for instance Duck hunters need places for safe shooting; they also need to know that duck nesting grounds in sufficient size and location are kept available to maintain the duck population at whatever size is needed. Duck hunters have been very successful in organizing within the sporting fraternity programs to buy up wildfowl nesting areas, and also to set aside some areas of suitable publicly-owned land to withhold from other uses principally for the benefit of ducks and, in turn, of duck hunters. This program has been going on long enough so that it has rather wide public acceptance and public support.

Upland bird hunters receive wide public support for another type of program, that of raising and releasing game birds. Bird hunters, though, must have access to shooting grounds. Among this circle of sportsmen there is growing concern that more lands somewhere should be set aside for this purpose—that is, managed primarily to assure access to and use of shooting grounds for upland bird hunters.

It happens that these two examples do not particularly conflict with the use of wild land that the pulp industry must be able to have. Wildfowl nesting grounds, and upland bird shooting grounds, are not necessarily very good timber producing land. However, a conflict involving one kind of shooting may be in the making. The growing number of privately-owned hunting club areas, where other uses of the land are considered out of place, may be significant as a developing problem. The owners of some of these areas want them for a single purpose only, and they usually think it a fine thing if there is a good wide buffer zone of unmolested timber land to assure seclusion.

Water users are another group with a particular kind of interest in the same sort of wild land that interests the pulp industry. In all parts of the country there are pressures by water user groups to have wild land on their watershed managed for either the sole or main benefit of the water user or down-stream resident.

There are a dozen acts of Congress which give special recognition to watershed management needs of specific national forest watersheds. Most of these situations are, or can become, focal points for pressures to have watershed problems receive special consideration, including limiting or precluding other uses of the land within the watershed.

Most western national forests contain watersheds to which a particular community looks for its water supply. In Oregon and Washington, for instance, there are now 112 such watersheds for which written special administrative procedures are in effect concerning the management of the watersheds. All of these are areas where some water board or city council, faced with public health or other similar problems, could make a spirited case for the watershed to be set aside for the benefit of one group.

Set-asides . . . set-asides How many of them can we stand?

Since World War II the problems of recreational use of forest land and other wild land have received a great deal of attention by foresters and timber department managers. The statistics are impressive. On the national forests there were 27.3 million recreation visits in 1950, 45.7 million in 1955, an estmated 90 million in 1960, and a forecast of 100 million in 1961.

Visits to the national park system are: 1950, 33.2 million; 1955, 50 million; 1960, 66 million, and 69 million anticipated visits in 1961. And all the trends are up. We now estimate that there will be some 600 million recreation visits per year to the national forests by the year 2000. Many of the companies in this industry are having similar experiences on their lands.

You who keep pulp mills supplied with timber, and we who manage wild forest land, need to be realists about the problems ahead in handling recreational use of forest land. People come to a forest to picnic or camp because they want a particular environment. Living water. Shade from trees. Open spaces for a table and for a fire. A chance to see wildlife.

These are what people want when they come to the small camp or picnic ground that is typical of your tree farms and of the national forests. We will be well advised to take some pains to see that people who want it have a chance to find that environment. Ordinary timber harvesting methods won't always fit well in popular recreation areas. If we are to be realists, we must recognize this fact.

Timber harvesting adjacent to and in, recreation areas can be done if it is done on a very careful and very selective basis. The Forest Service has proved this repeatedly, and so have many industry foresters. If between us we fail to adapt timber harvesting methods to meet the bona fide needs of average recreational users, and if we also fail to explain what we are doing so that people with an ordinary amount of curiosity will understand the "why" and the "how" of timber harvesting, we will probably face strong future demands for further recreation set-asides in areas where it is feasible to fit recreation in with other uses.

As a nation we need to do some straight thinking about set-asides, the whole problem of withdrawals. There is a place for withdrawals. All major wild land uses will not always mix with all other majors uses. We don't expect to grow timber in industrial areas, or in dedicated highway rights-of-way. Timber production or water storage do not mix in outstanding recreation areas like the national parks, and in some types of wildlife sanctuaries. For these uses the dedication of sizable areas of public land to a single major use is justified as public policy. But the land resources of the United States cannot support all the single-use withdrawals everyone might like to have.

This industry is aware of proposals made and repeated within the last year for additional areas of multiple-use-managed national forests to be changed over to recreation-use-oriented national parks. There is no official list that encompasses all these proposals. Records accumulated from published suggestions total in excess of 10 million acres. But the withdrawal problem is much broader than this. There is no limit on the kinds of special areas people will dream up and want to have established.

A part-time manufacturer of bows and arrows once argued strongly with me that because of the scarcity of good stock, all public lands which support a growth of Pacific yew should be delineated and managed primarily for production of yew bow stock.

Some areas within a few national forests have been earmarked to provide sharp-tail grouse breeding and rearing grounds, even though this has meant curtailed production of other resources.

There is a three-county area in Michigan, the wooded portion of which is the natural nesting area of a rare warbler, Kirtland's warbler. A strong move was started some years ago to have public lands there set aside and managed for the primary

purpose of maintaining the nesting habitat required by this very rare species. Instead, cutting practices on some public lands were modified to fit.

We in the Forest Service are in favor of yew trees, and sharp-tail grouse, and Kirtland warblers. But we are not in favor of meeting all the special needs of this character by setting aside special areas, each to be managed to meet some single need.

The Forest Service answer on how to meet most of these special needs is through the practice of multiple-use management of wild lands. We are firmly convinced that most public lands will have to be managed under this principle, and no doubt many privately-owned acres will too, if the nation's needs for land in the next 50 years are to be met. Accommodating other uses will have some impact on the amount of timber that can be grown. It is up to the forester, all foresters, to find ways to offset the potential impacts by more intensive timber cultivating.

The discussion to this point is background to make two pointed observations in answer to the question, What will be the impact on pulpwood production of forest land withdrawn for other uses. I do not differentiate between pulpwood production and timber production in commenting on this question.

First, the impact on timber production will be significantly less under well conceived and well applied multiple-use plans than will be the case if other uses which multiple-use planning could accommodate are met instead through the designation of special areas withdrawn for special management. Even intensive recreational use should not preclude harvesting timber, although some changes in cutting practices, and probably lengthening of rotations, will be necessary in recreation areas proper and in the scenic zone around them.

Second, it is as much to the interest of the pulp industry as of any group I know to help make multiple use work on wild lands in public ownership, and perhaps on wild lands in private ownership too. This includes helping to develop techniques for making multiple use work under conditions of increasingly intensive use.

A word about wilderness areas Congress has now directed that establishment and maintenance of wilderness be recognized as consistent with the purposes for which national forests are managed. The Forest Service accepts and agrees with this principle, and so do many members of your industry. The questions still to be hammered out involve: how much wilderness area is needed altogether; where will additional areas be located; what land will be included in them; and must commercial timber producing land be included in any of these wilderness areas.

Public policy requires that the Forest Service make decisions over the

Closer Cooperation Necessary

between pulp and paper scientists and forest biologists

"*Forest Genetic Developments*"—Donald D. Stevenson, Buckeye Cellulose Corp.

STEVENSON

WITH THE ADVENT of tree improvement programs in several parts of the country during the past decade, forest biologists have made the wood-using industries aware of the possibilities of upgrading tree quality to increase yields and lower harvesting costs. With woods labor expected to be at a premium in the years ahead, it was not difficult to convince industry management that tree breeding for increased vigor and better tree form might pay off with higher yields and reduced labor costs in the future.

Criteria for the ideal tree in the woods could be drawn up to satisfy nearly everybody—a rapid growing specimen, tall and straight, with the minimum of taper, well pruned, with fine branching. It was another question, however, when it came to wood quality. What were the ideal wood components for mill processing and products? If the papermaker could obtain a standardized product, a uniform and improved raw material which might lower conversion costs, what wood characteristics from the tree species available would he prefer? The forest geneticists were prepared to go into breeding programs for wood quality if the economic justification was evident.

It was at this point that the lack of technical communications between forest biologists and pulp and paper chemists became clear. Quality control was being stressed in the mill, but there was little if any idea that the raw material might be improved in quality before it got to the mill. Those in charge of tree improvement programs had few positive responses to the basic questions I have just mentioned.

The need of closer relationship between pulp and paper scientists and forest biologists and the unanswered question of wood quality criteria came to the attention of Drs. Kramer and Zobel of the Texas Forest Service, an agency which had been pioneering in tree improvement work. They wrote to the Technical Association of the Pulp and Paper Industry in 1956 and suggested that TAPPI sponsor some meetings to discuss these problems. As a result, an informal meeting was held in New York in 1957, attended by 15 forest biologists, the members of the TAPPI Fundamental Research Committee, and some other paper industry representatives. The forest biologists passed a resolution asking TAPPI to consider the establishment of a committee on forest biology to interchange information between members of TAPPI and those working in the sciences which form the biologic

next dozen or so years about how to classify some 50 areas which now are designated as primitive areas or which have some other special status which requires that they receive further study. These areas total about 9,000,000 acres in size.

Some of these probably should be transferred to wilderness designation and some should not. Some probably should not be so transferred except with a change in boundaries. Logical boundaries for some of these areas will undoubtedly require including some commercial timber-producing land. We believe the Forest Service cannot take the position that such land should never be included. Rather the decision must turn on this question, Should a particular area be established as wilderness? If it should, then what are the logical boundaries to maintain the fragile environment which distinguishes a wilderness area?

Within about the last six months the Secretary of Agriculture has accepted recommendations of the Chief of the Forest Service to establish two wilderness areas. During the same period the regional forester at Portland, Oregon, re-examined and declassified four "limited" areas that were designated some 25 years ago for further study.

This action has been criticized by sincere people because the final boundary of one of the wilderness areas established by the Secretary included more commercial timber lands than they thought was necessary. The action has also been criticized by equally sincere people because the area established is thought to be much too small.

We believe it was right to establish these two areas as wilderness, just as we believe it is right that within the whole system of national forests wilderness use is important and belongs as part of the philosophy of multiple-use management. Having decided that these areas should be wilderness, we then settled on what we believe are the boundaries needed to maintain the subtle environment that is called wilderness.

I've been talking about land, and land management decisions. I should also have been talking about people. The land management professionals of this country face a job more complex than we've ever faced before in finding answers to the technical questions involved in continuing to make multiple use work. There is an even bigger job that faces leaders of all segments of the economy that are concerned with this land problem. That is getting people in general to understand and support what the forest land managers are undertaking to do. In the years ahead it seems to me inescapable that this industry will be vitally concerned with explaining and gaining support for multiple-use management of wild forest lands. ■

foundation of forestry. This was later approved by the TAPPI Executive Committee, and the first formal meeting of the Forest Biology Committee was held during Paper Week in 1958.

As constituted, the committee was made up of 8 pulp and paper scientists, 18 forest biologists, and 8 men from woodlands departments. Representation was drawn from all parts of the country where tree improvement programs exist. It was the desire of those organizing the committee to have the counsel of pulp and paper scientists, those engaged in forestry research and development, and operations foresters. In the line with TAPPI's international character, the committee has representation from Canada and from Australia.

Objectives of the committee as formulated at the 1958 meeting are:

(1) To provide for interchange of information and points of view between forest biologists and persons knowledgeable in the fundamentals of pulping and papermaking which will orient, inform, and encourage programs for the genetic and silvicultural improvement of those qualities in pulpwood which affect the economy and facility of processing and the properties of pulp, paper, and paperboard.

(2) To stimulate the development of improved methods for sampling of wood from individual trees, and for characterizing both wood samples and pulp samples derived from them, in terms of their anatomical, chemical, physical, and physico-chemical properties.

(3) To encourage early and adequate recognition of the fact that the successive steps of developing the raw material and of processing it are interrelated, from the earliest selection and breeding of the trees, through the management of the forest stand and the stages of processing in the mill, to the ultimate use of the manufactured product.

It should be stressed that this committee is concerned with woods management only as it affects the character of the raw material. It is not developing programs for the growing and harvesting of trees for pulpwood. It seeks to encourage, not undertake, programs to improve wood qualities affecting the properties and processing of pulp and paper.

The committee's first project has been the preparation of a selective annotated bibliography of the world literature dealing with environmental and genetic influences upon quality of trees for pulpwood. About 1000 references have been assembled and the subcommittee undertaking this work, under the chairmanship of

PULPWOOD properties influencing pulp, paper processing and sheet properties.

Phil Larson of the Northern Forest Genetics Institute, USFS, is now engaged in making abstracts of these references. This bibliography, more comprehensive than any other yet undertaken in this field, is considered essential for practically any activity that the committee might undertake or sponsor.

The second project has been a digest of current information on 13 pulpwood properties viewed as variables which affect processing and the result-

ing pulp and paper product. As stated in the report on this project: "Forest scientists who may manipulate both environmental and genetic circumstances of wood growth should understand which of the variable properties of the raw material are of significance to the papermaker in processing and in terms of the properties of the resulting pulp and paper product." The report was prepared by a subcommittee with Phil Joranson of the Institute of Paper Chemistry as chairman and some 25 collaborators representing pulping and papermaking, forest biology, and woods operations and research.

Current information is summarized in this report on the effects of wood density, proportion of springwood and summerwood, growth rate, chemical composition of wood, fiber length (average and distribution), fiber width, fiber wall thickness, fibrillar angle, fiber strength as it exists in the wood, fiber-to-fiber bonding strength, knotwood, reaction wood, and preparation of non-fiber wood cells. Also included are discussions of correlations between wood properties including core wood —outer wood contrasts.

Improvement in wood properties that may be significant to the industry is the question that arises during any discussion of these wood and pulp properties. This report makes several general observations on this question. Thus, in many Southern pine operations, a 5% average increase in wood density, through selection for this property would be expected to have a more favorable economic impact than selection which produced a 5% average increase in fiber length.

Again, for most full chemical pulping operations, especially if followed by bleaching, an average reduction of lignin content of as much as 2 to 3% would appear to be attractive, other things being equal. A comparable increase in alpha cellulose content would probably be worthwhile in chemical pulping because of its favorable effect on pulp yield.

A chief barrier to efficiency in the industry is the heterogeneity of its product composition and, further back, of its raw material. Thus the fibers matted together in a sheet of any specified grade of paper are far from uniform in many of their properties. Individually, each of the constituent fibers must tend either to contribute to or detract from the over-all quality of the sheet for a specific use. The wood material, also, before processing, is likewise a complex of materials, arrangements, and properties.

These two kinds of heterogeneity work against sales and production efficiency. Effective sales require a uniform product and efficient production depends heavily upon uniform processing. Progress is made toward both objectives if the day-to-day supply of wood to the mill can be managed so as to reduce important variations in average wood properties.

How can important variations in average wood properties be reduced? The several tree improvement programs throughout the country are working on this problem. The development of trees genetically similar as to significant wood properties is one answer. A second approach is to effect biological control to reduce important wood differences between stands. This sort of manipulation is within the work of the silviculturist. A third method which could be adopted by some mills is to mix individuals together to obtain the average properties or property combinations sought.

From the processing standpoint, a combination of the first two methods is the most desirable. For the present and immediate future, the third approach commends itself. Specifically, a forest manager, aware of the aver-

Chips Show Strong Gains

throughout most of U.S.; Lake States on threshold of chipping

CHIP PRODUCTION and the resulting better utilization have helped to keep this a richer nation in forest resources. During 1960, 17% fewer trees were required by the pulp and paper industry because of this program, thereby strengthening our forest reserve. The Pacific Northwest, the cradle of chip production, continues to supply over 40% of its pulp fiber requirement from sawmill and veneer mill residue, with many of its pulp mills using this source for more than 90% of their needs. The South—producing more than half the nation's paper tonnage—reached a new high in chip production, 11% of its wood requirement. The Northeast and the Appalachian area are showing strong gains in this field of utilization, while the Lake States area is just entering it. Several more Lake States pulp mills are evaluating such a program for their areas.

Chip production is used here to embrace those chips produced away from the pulp mill primarily from woods not otherwise used in a major forest products industry. **Utilization** is used only with reference to the degree of completeness to which the tree's substance is used in a salable product.

"A National Survey of Chip Production and Utilization: Its Present and Future Potential" **—T. N. Baker, St. Regis Paper Co.**

BAKER

Significance of chip production to the nation is difficult to measure accurately, but it has been said, and justly so, that the recovery of wood residue as chips is the industry's most rewarding utilization achievement of this century. These chips have provided relief for many points in the

age wood characteristics in the various stands under his control, may be able to plan his harvesting operations so as to furnish the pulp mill with a reasonably uniform average wood raw material from relatively large areas for extended periods of time. Here is where we need wood quality indices based on the mill requirements that could be applied in the woods.

Technical sessions were initiated at the time of committee organization in 1958, under the sponsorship of the Forest Biology Committee. A symposium on needs and problems pointed up mutual problems which papermakers and foresters might work on together.

Prior to the World Forestry Congress last year, a Forest Biology Conference was sponsored by the committee at Seattle. The conference was opened by J. R. Lientz, president of TAPPI, and the two principal addresses were given by Dr. J. L. McCarthy of University of Washington, and Dr. L. R. Thiesmeyer, president of Pulp and Paper Research Institute of Canada. The subjects of the technical sessions carried out the conference theme, "Better Fibers from Better Trees through Forest Biology."

The first subject, "Evaluation of Wood Properties," had to do principally with methods and procedures to be employed in wood property analysis by the forest biologist.

The second technical session was a panel discussion on the question: "Can biological improvement of fiber properties keep pace with technological advances?", a topic on which there can be endless debate.

In the third technical session of the Conference, variations in wood properties as influenced by inheritance and by environment were discussed.

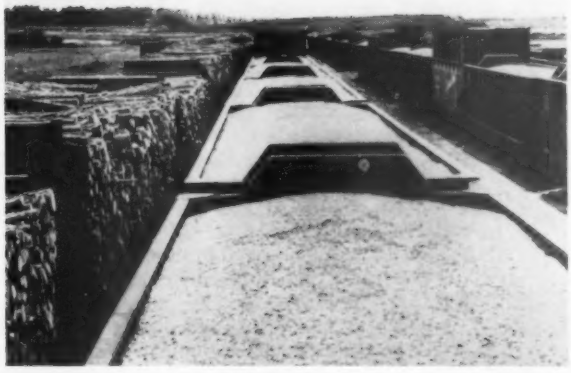
Heritability of wood properties in conifers under the categories of weak, moderate and strong, were listed by Dr. Bruce Zobel in a recent article in *Southern Lumberman*[2]. On a percentage basis, heritability may run very high—70 or 80%. Or it may be very low—and only 10%. If a wood property is loosely controlled genetically, that is, heritability is weak, environmental control may be the best course. Where natural stands must be dealt with, environmental control is the main course of action possible. Even here, however, some genetic principles apply as, for instance, where choice of seed trees are involved. Some genetic improvement of subsequent stands in vigor and form most certainly could be realized through judicious seed tree selection when following this regeneration scheme.

The fourth technical session of the Seattle conference took up the influence of wood and fiber properties on pulp and paper characteristics.

It is too early to assess the achievements of the Forest Biology Committee in wood quality improvement by genetic or other means. The committee hopes to be mainly a catalyst to stimulate work in this field. If it does nothing else of real significance but bring papermakers and foresters together for round table discussions on wood and pulp improvement, I believe it will have performed a useful function. ■

Literature Cited

[1]Forest Biology Subcommittee No. 2 on Tests and Quality Objectives, "Pulpwood Properties—Response of Processing and of Paper Quality to their Variation." TAPPI 43, No. 11:40-A (1960).
[2]Zobel, B. J., "Improving Our Trees—How Much?" *So. Lumberman*, pp 153-158, December, 1960.



PULPWOOD RACK CARS and chip cars on adjacent tracks illustrate the position waste wood chips have earned among conventional forms of pulpwood.

WOODEN MOUNTAIN made by chips in outside storage represents rapidly growing trend toward this preferred form of inventory.

papermaking system.

The heavy forest drain has been relieved so that forest can be managed with a freedom from pressure to cut timber which has not attained its peak of growth. The supply of 6,900,000 cords equivalent units of chips per year has the same effect as adding an equal number of acres of forest land to the nation's resources, assuming one cord growth per acre per year.

The flow of chips into the pulp mill has relieved many a woodyard, by allowing time for maintenance and for better scheduling of operations. Several new mills, confident of a chip supply, have saved the capital investment normally required for woodyard

construction. Even more significant, several more mills, the construction of which would not have been justified by the availability of wood in other forms, have been built based on the availability of wood chips.

Presently chips are being produced from green mill residue, primarily slabs, edgings, trimmings, veneer cores and roundup. Most of this volume is produced by lumber and veneer mills with a capacity of 20 MBM per day or more, because of the relatively high capital investment. The need for debarking the wood before chipping eliminates many forms of wood residue from the supply of recoverable wood waste.

Besides providing a valuable fiber source, chips have helped to create other benefits to the paper industry. Waste wood chips have called attention to the advantages in handling which chips have over other forms of pulpwood. The result is that chips are becoming accepted as a preferred fiber form. At least one paper mill in the South is initiating a program to have all wood converted into chips before delivery, a move which will streamline wood handling by capitalizing on the fluid flow characteristics.

Outside bulk storage of chips is a necessary part of chip production as it assumes a major role. The Pacific Northwest originated outside bulk storage and proved it desirable, with their species and climate, but questions remained with regard to other species and other areas.

Several studies were conducted in the South to determine the practicality. Each test reported that there was no more loss of quality and yield in chip storage than in roundwood storage and the chip storage offered many advantages. Woodyard operations can be scheduled better; a breakdown in the woodroom is less apt to create a chip shortage at the digester; handling cost of wood inventory is lower and can be automated; the lower cost of handling inventories can justify a continuous rotation to minimize time in storage and to provide the pulping process with even storage age wood.

These are some of the advantages offered by the outside bulk storage of wood chips. The minimum time in storage and the even storage age of the digester furnish offer an unmeasured opportunity for better utilization. This could be derived by adjusting the cook to suit the wood and thereby eliminate the overcooking of a part of each digester charge, a procedure which can not be done when wood of all extreme variations of age in storage is supplied to the digester in ever changing mixtures. Many Southern mills are following the example of the West by moving into outside chip storage.

What promises for the future does chip production hold? It has been estimated that 85% of the nation's wood residue, recoverable by methods in common use today, is already being recovered; by this the limit of production would be 8,100,000 cords annually. However, this is not a true picture of the full potential of chip production, for chips from wood residue can be increased well beyond the 6,900,000 cords produced in 1960. Approximately 1,000,000 cords of additional chips are available with presently used methods and equipment, a large part of which is in species considered to be secondary.

The South currently has a supply of hardwood residue above the present market requirement. The Northeast has chippable pine material for which no market exists. There is a challenge for the paper industry to provide a market for these secondary species.

Other wood chips will come from residue sources not available to the commonly used methods of recovery. It must also be noted that better utilization is independent, to a large extent, of the lumber market, but that the volume of chip production is highly dependent. This additional wood is available from logging resi-

Small Owners are Key

to pulpwood supply in Tennessee; Bowaters stresses cooperation

"STABILIZATION of pulpwood production" is the establishment of a flow of fresh wood to a mill, in sufficient quantity and quality, to meet the current requirements of that mill.

To those who have the job of supplying the wood requirements of a pulp mill, this is no new problem. However, it varies considerably from mill to mill and from region to region. I am confining my remarks to the mill in the Tennessee Valley with which I am connected: Bowaters Southern Paper Corp.

In our area the bulk of the wood delivered is so-called market wood, cut by a multitude of small, independent pulpwood producers, from many small ownerships. Some wood is harvested from Forest Service, state and company ownerships but this constitutes only a minor portion of the total and even this stumpage is in small parcels not suitable for large scale logging operations.

"*Stabilization of Pulpwood Production*"—R. R. Edgar, Bowaters Southern Paper Corp.

EDGAR

I am frequently asked by my colleagues managing the mill why it should be so difficult for the Woods Department to provide fresh wood in an even flow that continues week after week, month after month. "After all," they say, "orders covering mill requirements are given well in advance." I get the impression that mill people consider this an easy assignment.

Too often woods operations are taken for granted and the problems of wood procurement considered distinctly secondary to those of mill operations. In many instances this at-

due, planer chips, saw chips, thinnings and residue from mills cutting less than 10 MBM per day; each requires special treatment.

Logging residue, considered here to mean that part of the stem of the tree left after logging and the small timber damaged by the logging operation, is available in all areas. Locations where the concentration of residue is heavy and the prices are large might be relogged to a portable or semiportable mill for barking and chipping. Prelogging of small trees for pulp is another method of approaching the accomplishment of this task. Treelength logging, to a 4 in. top, can recover approximately 5% more fiber.

Another important source of wood fiber is planer chips. It is estimated that the nation's planer mills make a volume of fiber into planer shavings equivalent to one-sixth of the paper industry's wood requirement annually. This waste of fiber could be materially reduced if the green lumber were sized on a special machine that could produce a pulpable chip. Work on chip blankers for sizing green lumber has been underway for several years, but the program has failed to raise sufficient enthusiasm to obtain the proper support.

Saw chips, which are produced in lieu of sawdust by special saws in which each tooth takes a longer bite, are usable in some pulping processes. A sawmill using a circular head saw and already producing chips from slabs and edgings can achieve approximately a 15% increase in salable chips through the use of this type saw on a head rig and the edger. The present market for this type chip is limited and it will have to be expanded to make recovery possible.

Thinnings of natural and planted stands before the trees reach a merchantable size and the thinning of suppressed trees of submerchantable size could develop a large volume of wood fiber. This type of fiber could be desirable in many products, when delivered at a competitive price. Thinnings also offer problems to harvesting and debarking which must be overcome to produce an economical chip.

The residue from lumber mills cutting less than 10 MBM per day represents a smaller percentage of the lumber cut today than it did in the past, but it is still a major source of wood fiber. The system most successfully applied to this size operation today is to debark the logs at the sawmill and concentrate the clean residue for chipping. This method can be applied to many locations that are not currently recovering their residue, but a major breakthrough is necessary if an appreciable volume of this material is to be recovered.

Conservationists have discussed a major breakthrough that would allow the recovery of pulp chips from residue that is either physically or economically impossible to debark with machines that we have at present. Today, a system for the separation of bark and wood chips is discussed in relation to the future of chip production, but today it is because the fruits of such a breakthrough lie in the future, for it appears that such systems are soon to be available. One pulp mill in the South is reported to be installing a process that could open several avenues for more complete utilization. Many have worked and continue to work on systems for the separation of bark and wood chips.

It is desirable to continue to improve wood utilization and through creative thinking, careful planning and industrious work, a much greater volume of residue chips can be made available. The remarkable achievements of chip production to date should serve to stimulate even greater gains for the future. ■

titude may be justified. However, woods costs cannot be ignored with impunity very long since they may run as much as 40-50% of the "out of pocket" costs of finished paper and pulp. Wood costs to a mill may well be decisive in determining whether or not operations are profitable.

The paper industry is now experiencing rather difficult days, characterized by a buyers' market, higher costs and a profit squeeze. Customers demand a superior product with no change in the price paid for it. This type of pressure has in turn resulted in mill demands for better wood from which can be manufactured cleaner, stronger, and brighter paper and pulp.

The inevitable result of this development is mill insistence on receiving fresh wood direct from the stump. Deterioration of wood in inventory must be eliminated by reducing inventories to a low level.

Such a low inventory policy is out of the question unless the flow of wood has been in some way "stabilized." The history of the industry in the South has been to work toward this goal. However, if it is overdone there is always a time of "alarums and excursions" when some of the mills find themselves in difficulty with no wood at all.

The low inventory policy has the advantage of reducing the amount of working capital tied up. However, at the moment wood quality appears to be the overriding consideration.

In order to provide the desired flow of fresh wood, many problems must be met and solved. Some are short-term problems and others long-term.

Short-term problems include the weather, competition for labor by agriculture at certain times of the year, current availability of stumpage, supply of rail cars, competition for stumpage and labor by other wood-using industries and mills, and many others.

Long-term problems include first of all the overall quantity of available stumpage; i.e., whether there is a favorable or unfavorable balance of growth in the procurement area of the mill. This is affected by insect and disease incidence, efficiency of fire protection, the pattern of land ownership, the encroachment of forest land by metropolitan areas, highways, power lines, and recreation areas, hydroelectric projects, the reversion of agricultural land to forest of vice versa, the wood-using capacity of other wood-using industries in the area, and the various species of wood for which there is a demand.

The long-term supply of wood is very susceptible to the influence of government. The means by which the government applies taxes and social legislation can greatly influence the development of future timber supplies for good or evil.

The advance in logging methods and forestry methods, the basic knowledge of how to grow and harvest wood more efficiently all contribute toward solving the problem of how, in the long term, to stabilize the flow of wood to the mills.

The availability of stumpage is the most important single factor fac-

ing us. The presence of stumpage in an area does not necessarily mean that it is for sale or for sale at reasonable prices. A ready availability of stumpage is a must if the flow of wood is to be stabilized. Many landowners reserve their timber as a bank account for a rainy day which in good times they withhold from the market but will release only in periods of recession when it is least needed. The National Forests may or may not place wood on the market depending on their cutting budgets, availability of funds for timber sale purposes, et cetera.

This factor of uncertainty has been the main reason why it has been difficult in our area to stabilize wood flow. It has also been the chief reason why it has been difficult for a class of reliable steady producers to develop; producers who could be assured of always having an ample supply of stumpage to cut so that they might be justified in investing in more efficient logging equipment. The stumpage uncertainty is also the main reason why woods work does not attract a higher type of entrepeneur, who might be interested if he were assured of steady work and thus a higher annual income. Pulpwood producers can earn a satisfactory annual income if they can work steadily. Bad weather and lack of stumpage are the factors which, by reducing working time, most seriously reduce earnings.

Availability of company stumpage does not serve as a means of coercing pulpwood producers (contrary to testimony which some labor leaders have given at Congressional hearings). It does serve as the balance wheel to provide steady year-round work and a higher standard of living.This stumpage can be made available when other stumpage for many reasons may not be purchased.

Our own timberlands are in the process of development; we have planted over 100,000 acres in the past eight years, but it will unfortunately be several years before they will constitute an important factor in our procurement plans. In the meantime we must rely on what is currently available. In any event timber from company land will in the future be used mainly to supplement open market purchases. They will supply stumpage and jobs to producers when they are not available elsewhere.

When we first started our procurement program there were no mechanical yards in the procurement area, although there were some in other parts of the South. We established such yards, equipped with mechanical loading equipment along railroads and at rivers. This alone made it possible for the producers to increase their earnings by eliminating hand loading of rail cars and by providing a steadier market. Beyond this, the usual method of logging consisted of felling and bucking with a power saw and loading the wood by hand on a bobtail truck driven into the woods. Where the terrain was too steep, mules skidded tree lengths to a truck where the wood was bucked prior to loading.

The so-called "Big Stick" loader has been introduced to our producers since that time. This simple loading device, costing about $900, caught on fast and soon over 80 were in operation. This took the heavy effort out of the loading operation, one of the most strenuous and time consuming tasks of the whole logging sequence. In addition to loading it would skid wood in single sticks or bundles for distances up to 150 feet making it possible to reach many places without laboriously carrying out the wood by hand.

This unit has recently been improved by placing a power swing on

OLD METHOD of harvesting required truck in the woods, hand-loading of heavy pulpwood, more labor.

NEW METHOD utilizes mechanics to reduce labor load, increase efficiency. This truck has high load adaption.

SMALLER UNIT here has only big stick loader. It reduces work load on pulpwood team, increases production.

BIG STICK LOADER here is equipped with high load adaption. Boom at left is high-loader; singing boom is at right.

the boom. A considerable number of these power booms are in service now and are receiving a good reception from the producers since the power boom further reduces the work of loading and speeds it up considerably.

Since only 20% of our timberlands are on slopes of 10% or less and much of them on slopes which are most precipitous, it was decided to further modify the Big Stick loader by adding a haul-back line and more drum capacity. Only one unit has been constructed and a second improved model is now being assembled. This machine skids over 400 feet and on any terrain, in fact the steeper the better. A unit of this type operated by a three man crew can produce from the stump six cords per day on a 15 mile haul. By eliminating the mule and the work of caring for and feeding it, plus the cost of hauling it from job to job and providing shelter, we feel a considerable advance has been made plus the fact that this machine will log terrain too difficult for a mule.

Drops in mill production that we did not anticipate have been experienced, and likewise we have had surges in production which we could not always forecast. In an effort to determine how small an inventory it is safe to carry and to assist in making the other procurement decisions for the immediate period ahead, we felt we needed some better way of determining the intentions of the hundreds of producers who sell us wood and over whom we absolutely have no control whatsoever.

We designed a questionnaire which is filled out by yard managers and dealers as they question the producers at the woodyards. In order to get a weighted average into our results, the number of questionnaires filled in at every woodyard depends on its quota for that month. The first producers to arrive at the yard are queried. This process is continued until the quota of questionnaires for that yard has been completed. The questionnaires are then tabulated by IBM.

This survey has been carried on once a month since last September. Frankly, we do not know yet how to interpret the results since there has been a plentiful wood supply all this time and no apparent change in the procurement outlook.

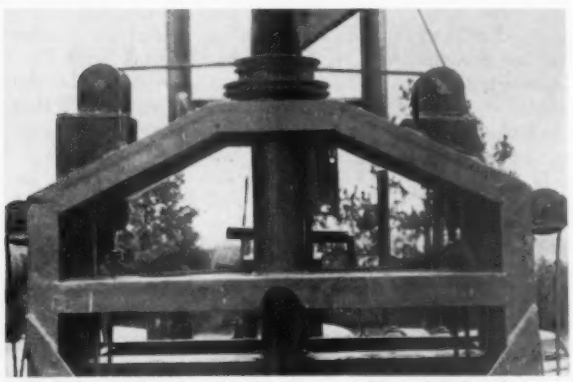
However, we hope to get some advance indication of what the trend in wood production will be. The two main cost items which influence the amount of money a producer will make are the cost of labor and stumpage, and the trends shown should eventually have considerable significance. The condition of the producers' equipment may also be a valuable indicator as to the economic health and efficiency of the producer.

Finally, I would like to describe to you a project we have undertaken in cooperation with TVA. When construction of our mill was first announced over nine years ago, there was some question whether the forest resource of the area was great enough to support an annual cut of 250,000 cords of pine. Since that time the pine consumption has more than doubled and hardwoods are used at the rate of 50,000 cords per year.

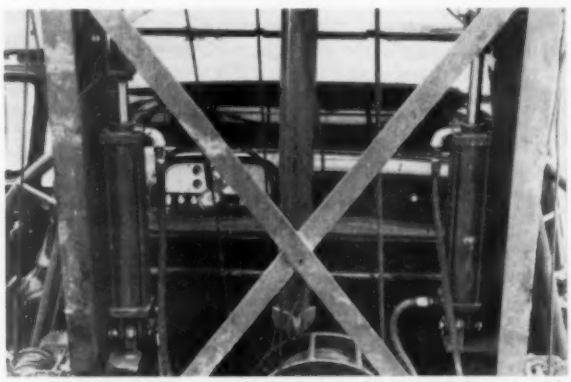
One of our main concerns was to determine whether the area immediately around the mill was being overcut since this area provides our cheaper wood. Of course, there were other users of pine in this area, chiefly small sawmills, but our policy, as the largest single user, would have the greatest effect on the ultimate fu-

SETTING CHOCKER around pulpwood bundle is one-man job. Chocks are simply designed, quickly unhooked.

HIGH ADAPTION for big stock loader permits operator to reach 150 feet into areas once virtually inaccessible.



DETAILS of high load adaption on big stick loader are shown in closeup of cable arrangement on boom.



HYDRAULIC RAM for free swinging boom equipped with high loader can be seen in closeup of winch.

ture potential for the area.

Since the start of operations we have deliberately brought wood in on longer freight hauls and limited our local cut, basing this policy on the inventory figures available to us at that time. By 1959 we felt the necessity for a more accurate system to determine if this policy was really sound.

I quote from the foreword of the report by TVA: "This initial report is based on a CFI (Continuous Forest Inventory) System of permanent plots established in the spring of 1960 by TVA in cooperation with Hiwasse Land Co. (Bowaters' woods company), Calhoun, Tenn. This joint research project will test the merits of CFI for measuring future trends in timber supply on one million acres of Tennessee Valley forests that help support some of the valley's largest wood-using industries centered at Athens, Calhoun, Cleveland, and Sweetwater. Aerial photos, funds and field crews for the bulk of the CFI work were provided by Hiwassee Land Co. TVA foresters designed and supervised the survey, collected data on the National Forest portion and compiled the data. The initial measurement will serve as the bench mark from which trends may be accurately determined in the years ahead. Remeasurement may be feasible within the next 3 to 5 years."

The area studied includes the Tennessee counties of Bradley, Hamilton, McMinn, Meigs, Monroe, and Polk. The mixed pine hardwood type predominates in this forest area. The basic data was derived from 430 forest plots which give an accuracy of ±4.4% at the 2-out-of-3 level of probability.

While the first measurment did not provide growth figures, which will be determined after the second measurement 3 to 5 years hence, we did have a "bench mark" of sorts to which we could relate the figures. TVA has, since 1950, been making forest resource inventories of most of the counties of the valley. Of the 6-county area one county was inventoried in 1950, four in 1954 (the year our mill started using wood), and one in 1958. Comparing these earlier figures with our CFI survey, E. G. Weisehuegel, Chief of the Forestry Investigations Branch TVA, made the following observations:

"An average 1.7% annual increase is apparent in the commercial forest area, which increased by some 156,000 acres, or 17%, during the 50's. The bulk of this increase is natural reversion as plantings during this period total only 46,000 acres. Reliability of the earlier forest area estimate is substantially below the standard set for 1960. In future remeasurements, changes from the 1960 bench mark can be ascertained more precisely.

"Pine hardwood types—stands in which hardwood species make up 76% or more of the dominant or codominant trees, show the greatest increase, i.e. about 141,000 acres (47%) as compared with the pine containing types (pine and mixed) that apparently increased by some 15,000 acres (2%). In other words hardwood is increasing at the expense of pine.

"Net volume of conifers shows an apparent increase of some 470,000 standard cords or 12% over a 6-year period. After making allowances for sampling errors in both surveys, we can definitely conclude that the pine supply is not being depleted.

"On the other hand, the indicated increase is relatively insignificant in light of sampling limitations. The present rate of increase is still insufficient to permit the desired building up of the growing stock. Continued conservative cutting in the yellow pine supply in this area is recommended and pine drain should not be expanded in the early 60's. Another look at the situation in 3-5 years using the more reliable CFI system should be considered.

"The long term potential of these six counties, assuming continued plantings and intensified forest management on private land, shows an ultimate yield of pine pulpwood and chips of from 450,000 to 500,000 standard cords on pine lands totalling in excess of a half million acres.

"Net volume of hardwoods shows an apparent increase of some 500,000 standard cords or 10% over the time interval, after adjustments were made in earlier estimates of cull material to conform with current culling restrictions. Expansion of hardwood pulpwood harvests by another 100,000 cords a year would be desirable in view of the surplus in this area."

The leading location of our company in this area makes it possible to some extent to influence the growth-drain relationship by providing the largest single wood market.

It is significant that 52% of all timber in the area is in sawlog size. Growth in sawtimber is of course not available for pulpwood because of its high value. Trees of this size have already grown beyond the reach of the pulpwood market and whether they are cut faster than they grow, by the multitude of small sawmills in the area, will not greatly affect the volume available in the future for pulpwood. In times of a booming lumber market sawmills will, however, cut pole size timber and this has been a serious competitive factor for pulpwood operators.

Another factor which is of great importance in any forecast of wood availability in this 6-county area is the high percentage of volume in the Cherokee National Forest; 45% of all softwoods and 37% of all hardwoods are in the Forest.

During the past few years the volume of pulpwood being sold from the Cherokee has been increasing at an encouraging rate. However, it must be recognized that the emphasis in the National Forests continues to be on the growth of sawtimber.

In addition to the basic inventory data the acreage of open land in need of planting was noted. These acres give our forestry extension a good target to shoot at.

Statistics on pine restocking by natural means, developed by the study, are also of interest. They found that 32% (254,300 acres) of mixed pine-hardwood having some pine present or showing evidence of its earlier existence, is inadequately stocked with pine and lacks seed sources. These acres must be planted or seeded artificially to bring them to a full level of productivity. This is one quarter of the forest area in the six counties.

It was also noted that hardwood tree encroachment is a serious matter on a large area of pine-hardwood land. About 519,000 acres have one fifth or more of their area covered with hardwood trees of various sizes, and these stands will continue to revert to hardwood unless artificial means are used to perpetuate the pine.

We believe that permanent CFI systems, set up in all major wood procurement areas, might be of considerable use to the industry. It might be advisable for any paper company contemplating expansion of present plant or building of a new mill to consider such a program prior to going ahead with construction, especially if heavy reliance is to be placed on market wood from non-industrial lands.

In the past the resource of the South has been large enough so that new mill capacity has always had sufficient wood available to supply it. This time appears to be nearing an end, at least until forest management catches up. The "lead time" on a planted tree is about 30 years and nothing can be done by foresters which will reduce this time very much.

A stable supply of quality wood is possible with sound planning, time and effort, and money. There are no shortcuts. To date we have just begun to use the tools available to us. ■

"Air Lift" Provides Flexible Chip Handling at Thurso, Que.

The chips really fly at Thurso Pulp & Paper Company, Thurso, Quebec. They travel by air, at rates which vary from 40 to 60 cunits (200 cu. ft.) per hour.

A new Rader Pneumatic chip handling installation, completed this year, gives the plant operators great flexibility in chip movement and storage.

Chips can be moved pneumatically to outside storage from any one of three sources. Rail cars on the spur track (right foreground in photo) are unloaded by flex-pipe, with the chips being directed by blower either to the hardwood pile (in photo), or the softwood pile, to the right.

The mill's own woodroom, the large building at the left, also produces chips which can be blown to either pile at a rate of 60 cunits per hour. The third source is a nearby sawmill, out of the photo to the right, from which a Rader system blows chips to the outside storage piles.

Adding to the system's flexibility is a second blower line from the woodroom, which can be fed either into the large silo (lower left), or valved directly to the storage piles.

For reclaiming chips, a large pit with surface grate is provided between the two storage piles. A front-end loader pushes chips into the pit, from where it is propelled by another blower directly to the silo. This system operates at 40 cunits per hour. From the silo, chips go to pulp mill by mechanical conveyor.

Write to Rader for information on pneumatic handling of chips.

RADER PNEUMATICS, Inc.

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Canadian Pulpwood Research

systematically attacks all growing and harvesting operations

***"Developments in Canadian Woodlands Research"*—Lowell Besley, Chairman, Woodlands Research Dept., Pulp and Paper Research Institute of Canada.**

BESLEY

IN THE CANADIAN pulp and paper industry, woodlands is an operating term which might be roughly translated as the plural of woods. When you have charge of the logging of a specific area, they call you a Woods Superintendent, but when you direct all forestry, logging and transportation operations of the company, they call you Manager of Woodlands or even (Happy Day!), Vice-President comma Woodlands. Thus all phases of harvesting, growing and protecting the next crop, and delivering the pulpwood to the mill fall within the domain of woodlands.

If we define research as the endeavor to discover facts by scientific study or investigation, we have a nice broad subject to discuss, even when we limit our perspective to the billion acres of Canada's forest land or its 600 million acres in productive forest.

With 700 billion cubic feet of merchantable timber in its forests, and an annual cut below three and a half billion, Canada has no national timber famine.[a] Exporting more than half its production of lumber, a fifth of its woodpulp and nearly three-fourths of its paper, its big research and development problem is harvesting the forest at a cost that will allow its products to compete in the markets of the world.

Since cost of materials represents 40 to 45% of the gross value of production of the pulp and paper industry, what happens in the woods is of great importance to its competitive position. Based on 1949 purchasing power, the average annual wage in woods operations increased 29% and the average annual capital investment 66% while the net value of production per unit increased only 10%. (Based on actual dollars, the comparable figures were 57%, 103% and 34%.)

Attempting to reduce woods cost per unit of volume will not be enough. The underlying objective must be to reduce woods and transportation cost per dollar of product.

To meet this broader goal, research must make a systematic attack on the whole forest growing and harvesting operation. Ever increasing wages and ever expanding distances from pulpmills to unexploited stands of diminishing density must be offset by greater man-day production, more efficient transportation systems, and eventually by growing denser, more valuable stands closer to the mill, where both management and logging can be concentrated on smaller areas.

Company management must make the economic decisions to choose between alternative methods and procedures. It is the job of research to furnish the physical facts upon which these decisions should be based.

Engaged in woodlands research are the federal government, provincial governments, universities and industry, both individually and cooperatively. Table I gives a partial list of some of the organizations involved. It is based on the rather fragmentary information and makes no claims at being accurate or complete.

Research center of the industry is the Pulp and Paper Research Institute of Canada. This institute traces its origin to a branch of the federal Forest Products Laboratories established in cooperation with the Chem-

Table 1. Partial Summary* of Persons and Organizations Engaged in Woodlands Research in Canada

Field of Research:

1. Harvesting: includes all pulpwood logging and transportation operations
2. Forest Economics and Management: includes also mensuration and inventories
3. Protection: against (a) Fire; (b) Inserts and Diseases; Entomology, Pathology
4. Silvics, Silviculture and Botany: includes forest and site classification, ecology, fertilization and nutrition, nursery culture, stand culture, regeneration, soils, taxonomy, tree anatomy and physiology, tree improvement
5. Wood quality: includes only studies relating wood characteristics to growing trees

Organization	*Profess. Workers Tot. No.*	*Man Yrs.*	*Field of Research 1*	*2*	*3(a)*	*3(b)*	*4*	*5*
Pulp and Paper Companies	130	30	x	x	x	x	x	
Pulp & Paper Research Institute Can.	13	10	x		x		x	x
British Columbia Res. Council	?	?						
Nova Scotia Research Foundation	3	1				x	x	
Ontario Research Foundation	?	?					x	
Laval University	8	4					x	
University British Columbia	12	3		x		x	x	x
University New Brunswick	4	1	x	x				x
University Toronto	12	3		x		x	x	x
McGill Univ. (incl. Macdonald Coll.)	5	1		x			x	
Ontario Agricultural College	1	—					x	
Queen's University	4	1	x			x		
University Montreal	4	1					x	
B. C. Dept. Lands and Forest	15	15					x	
Ontario Dept. Lands and Forests	22+	22+			x		x	
Quebec Dept. Lands and Forests	4	4					x	
For. Biology Div.	180+	180+				x	x	
For. Research Div.	80+	80+		x	x		x	
For Products Lab. Div.	75+	6(?)	x					x
Federal Meteorology Branch	?	?			x			
National Research Council	?	?			x			

*Approximate list only based on information available to author; not checked with organizations.

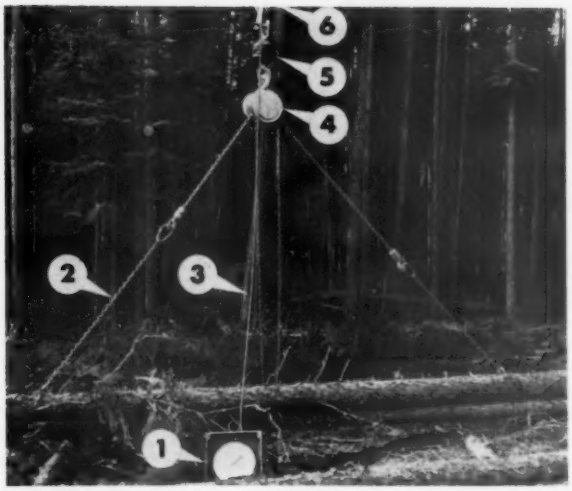


FIGURE 1 (left)—Apparatus to weigh trees: (1) gauge—tare removable, 10 lb. graduations, direct reading; (2) tree sling; (3) pressure line from load cell to gauge; (4) 2-ton chain hoist (modified by adding another hook) used to balance tree; (5) Martin-Decker 6,000 lbs. capacity hydraulic load cell; (6) crane hook.

FIGURE 2 (right)—Jam depth gauge. Representative survey of jam depths made with this instrument.

istry Department of McGill University in 1913. The Canadian Pulp and Paper Assn. became a third partner in 1920.

In 1950 the Institute was set up as a non-profit, tax-free, educational and research corporation, under federal charter.

The purposes of the woodlands research program of the Institute are threefold: (1) To seek improved methods in the logging and transportation of wood to mills. (2) To find ways for ensuring an increasing supply of pulpwood of improved quality. (3) To assemble and distribute technical information relating to logging, engineering and forestry matters.

Current program in harvesting is concentrating on basic studies on the forces involved in logging operations in order to arrive at performance specifications for equipment. These forces apply to handling and processing trees, and transporting the pulpwood.

Traditionally, in Canada, pulpwood has been cut into 4-ft. bolts at the stump. As late as 1957, about 53% of all pulpwood cut east of the Rockies was processed in this way and another 12% was cut into 8-ft. bolts.[4] At that same time there was no commercial full-tree logging in eastern Canada, and only a sixth of the pulpwood was handled in tree lengths. The cut-and-pile system fitted in well with an ample supply of unskilled labor on a seasonal basis at reasonable cost.

The situation is changing rapidly in many areas. Today, there is a strong trend towards year-round operation and mechanized wood handling with skilled operators. And, whereas there is an abundance of data on weights of 4-ft. wood, there is a serious scarcity of information on weights and centers of gravity of full trees and tree lengths.

When the design engineer is in doubt, he naturally ups the factor of safety. The result has often been larger, heavier, and more costly woods equipment that not only has to be operated way below its capacity nine-tenths of the time, but which also is less maneuverable, and may bog down in soft ground.

The Institute's first project in the series of Forces Involved in Logging is concerned with the weights and centers of gravity of pulpwood trees. Eventually, we hope to end up with weight tables or charts for full trees and for their merchantable portions, similar to cubic foot volume tables now available. We also wish to find the comparative weights of the solid wood stem as compared with those of limbs, tops and bark. And lastly, we are interested in the piled volume of slash coming from trees of different sizes and diameters.

The trees are preselected and marked to get a satisfactory distribution of species and sizes in the study area. The tree is felled on a road or cleared space, where possible, so that limbs lost in felling can be picked up and weighed. The full tree is then picked up with a crane and weighed with a Martin-Decker 6,000 lbs. capacity hydraulic load cell suspended from the crane hook.

The weighing apparatus is shown in Figure 1. A 2-ton chain hoist, modified by adding a second hook, is used in the system to balance the tree. The tare removable gauge with 10-lb. graduations, provides for reading the net tree weight directly. With the tree levelled up by the chain hoist, the center of gravity is marked on the tree, and later its distance from the butt is measured.

A top diameter of 3 in. is marked, the top cut off, and the topped tree again weighed and its center of gravity determined. The weight of the top is obtained by subtraction. After removing the limbs, the tree length is weighed and its center of gravity determined. Weight of limbs is found by subtraction. Lastly, the bark is removed and the weight and center of gravity of the peeled tree length determined. Weight of bark is calculated by subtraction.

Based on the measurements of the first 134 trees of white and black spruce and balsam fir at two locations (one on the Quebec North Shore—Forestville—and the other in northern Ontario—Longlac), full trees at 18 in. DBH weighed nearly 4,000 lbs., two-thirds of which was merchantable wood; those at 8 in. DBH weighed 570 lbs., only three-fifths merchantable; and those at 4 in. weighed 105 lbs., with only slightly over two-fifths (43%) merchantable.

These results are preliminary, but they do furnish some interesting food for thought. If you are cutting a typical stand of spruce-fir pulpwood averaging 7 in. in diameter, with only a scattering of trees over 10 in., and running about 15 cords to the acre,

would you use a harvester or buncher of 2½ tons capacity (an 18 in. tree weighs about 2 tons) for all your trees?

Or would it be more economical to use one of ¾-ton capacity, since 7-in. trees weigh less than ¼ ton, 10-in. trees weigh less than ½ ton, and 12-in. trees weigh just under ¾ ton? Perhaps one 2½-ton capacity machine could clean up all the trees over 12 in., while a dozen ¾-ton capacity machines were busy taking the other trees.

Likewise, suppose you were considering a full-tree logging operation where tops, limbs and bark were all to be removed at the landing. Of the approximately 53 tons of trees you would be taking from this acre, about 44% would be slash and bark that you do not expect to make into pulp. In fact, the 17 tons of slash and the 4½ tons of bark would create a disposal problem at the landing. If piled in loose piles, the bark from this acre might occupy 1,000 cu. ft., and the slash more than 12,000 cu. ft.

Among our other projects in this series, two are just getting under way. One provides for measuring the force required to skid trees of different size, with and without tops and branches. Separate analyses would be made for each of the major species and for various representative types of forest floors used in the studies.

Closely correlated with this, is a study of the bearing pressures of forest floors. Much information is available on different materials used in road construction, but insufficient is known about the forest floors "in situ." After suitable definition and classification of the various forest floors most commonly encountered in Canadian pulpwood logging, the loads which such floors will support will be measured. These measurements would be related to various types of loading, such as stationary loads, steady-wheel loads, and vibrating track loads. A second phase of the project would be an investigation of the possibility of developing a tool to measure, rapidly and directly, the bearing pressures of forest floors.

Pulpwood holding grounds and the forces involved is the subject of a long-term project to be completed during 1961. About two-thirds of Canada's pulpwood gets into the water for at least part of its journey to to the mill, and a substantial portion of it arrives at pulpwood holding grounds.

Very large sums of money are spent on the construction and maintenance of the booms, piers and anchors of these holding grounds. When the structures were built to possess more strength than needed, money was wasted. If, through underdesign, they failed, large quantities of valuable wood escaped. Yet comparatively little was known of the magnitude of the forces to be encountered, and the holding grounds were built on a trial and error basis.

Thus, eight years ago, the Institute employed a team of hydraulic engineers at Queen's University to conduct a combined laboratory and field study. The team studied the forces first for transverse holding grounds extending across the river, then for parallel holding grounds extending along one side of the river, and lastly for the more complex tidal holding grounds where tide and river current alternately oppose and assist each other.

In some instances, it had to devise its own instruments like the jam depth recorder in Figure 2, a tension test bar and strain indicator to measure the force on the boom at different points, and a pressure cell for measuring forces exerted on a pier. Standard current meters for measuring velocity downstream of the boom, and direct reading water level recorders for head differentials were quite satisfactory, but cube-tipped pitot tubes had to be poked through the jam to measure velocities underneath.

Of course, the key factor determining the forces which the holding ground structures have to withstand is the head of water backed up by the jam. The magnitude of this head is, in turn, determined by such factors as the velocity of the current, the depth of jam, and the depth of water under the jam. These factors are interdependent, and a fully instrumented laboratory flume was required to provide the controlled conditions necessary for their study.

Perhaps the stickiest part of the study concerned the calculations of the distribution of the total forces between various elements of the structure and the shores. Suffice it to say that these difficulties were overcome, and the results of the study have already been widely used in construction and modification of holding grounds.

One of our companies which built a large holding ground during the course of the study, reported that actual forces measured agreed within 7% of those predicted from the calculations. Furthermore, they state that the information from this study saved the company a quarter of a million dollars in the cost of its holding ground.

Hydraulic transport of solids in pipes over long distances has been proven practical in recent years. In collaboration with several equipment manufacturers and a construction firm, the Institute conducted a limited study on transporting wood chips by pipeline.

The pilot plant, Figure 3, furnished mostly by the cooperators, consisted of a mixer and mixing tank, a pump, and a tenth of a mile of 8-in. diameter aluminum pipe.

The Institute study has been concentrated on three factors: damage to chips, practical concentration of chips in the water slurry, and friction losses. Although passage through the pump definitely reduced the average size of chips, this resulted in little or no deterioration in the strength of the pulp produced when these chips were subsequently cooked by the soda base sulfite process (selected because of its notorious sensitivity to mechanical damage in chips).

Furthermore, mixtures up to 30% by volume could be pumped freely, with practically no increase in power consumption over that with water alone. Current studies, using a different pump and lower velocities, are determining the friction losses.

The chip pipeline is a high capacity bulk carrier which should be kept running continuously at close to its full capacity. It is capable of moving a large quantity of wood as chips from point A to point B. Already, at least one Canadian company is making a careful economic analysis of such a pipeline on its operations.

The harvesting program is aimed primarily at handling and transporting trees at minimum cost and maximum efficiency. A further need of the pulp mill is a reasonably uniform supply of raw material in order to produce a uniform product. There is a great deal of variation not only between wood of different species but also from different trees of the same species.

It will be a long time before Canada is breeding and cultivating a substantial portion of its pulpwood supply for quality and uniformity. Fortunately, however, any desired paper can best be obtained by a blending of fibers with somewhat different characteristics, and different papers have different requirements.

The proper mixture could be greatly improved if the forest stands on different parts of their limits could be practically classified in terms of wood properties. This classification would necessarily be made in connection with forest inventories and operating cruises. Consequently, simple field tools and methods would be required for making the classification.

Wood quality studies aimed at such an objective have been started at the Institute. Basically, the composition, dimensions, properties, arrangement

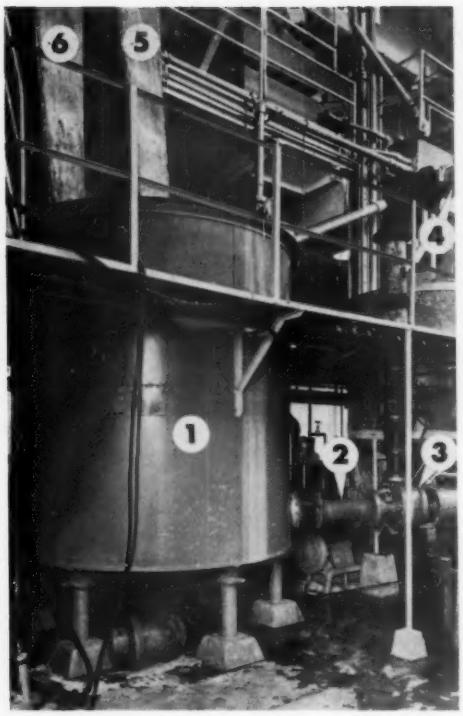


FIGURE 3 (left)—Part of pipeline pilot plant showing (1) mixing tank (side-entering mixer not shown); (2) suction line to pump; (3) pulp, discharges vertically about 8 ft.; (4) 8-in. dia. aluminum pipeline; (5) pipeline recirculating chute; (6) chip return chute from measuring tank.

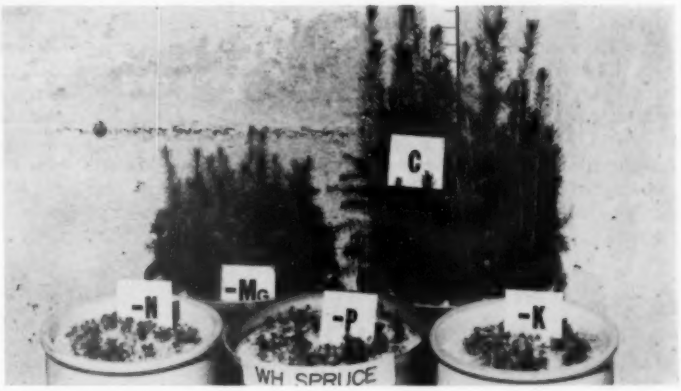


FIGURE 4 (above)—One-year-old white spruce (*Picea glauca* [Moench] Voss) greenhouse seedlings grown from seed in sand culture in complete nutrient solution (C) and complete solution minus nitrogen (—N), minus magnesium (—Mg), minus phosphorus (—P) and minus potassium (—K). Tallest seedling in (C) measures 24 in.

and distribution of the original wood cells will determine their worth for papermaking, but these characteristics vary widely and elude quantitative expression. Existing measures such as wood density and average tracheid length have proven misleading when used alone.

Anatomical studies have been initiated to discover some combination of measurements which can result in meaningful indices of wood quality. Once a definitive and practical expression of the raw material has been obtained, all wood used in process research could be preclassified, and correlations between raw material and paper product by different processes could be established. Thus, if the various stands on a company's limits have been classified by wood quality index, the woods manager could plan his woods operations to furnish the mill with the best available raw material mixtures for its end product.

Going back to underlying objective of reducing woods cost per dollar of product rather than merely per unit of wood, it is obvious that a greater concentration of more valuable wood favorably situated with respect to the mill will ultimately reduce logging and transportation costs and increase net value at time of harvest.

The question each woods manager must answer, however, is whether the extra logging and forestry costs bound to be incurred in obtaining this concentration will be more than met by the savings in logging and transportation, and the increases in value of product. Before this economic question can be answered, the manager needs to know the physical response he can expect from various treatments of his existing stands.

In tackling this problem with a very limited staff, the Institute has felt that progress can be made most effectively in terms of both speed and breadth of application, by a rather basic approach on its part, backed up by subsequent field trials. Thus we are trying to find optimum conditions for regeneration and growth, rather than being satisfied with making a treatment and waiting 60 years to see what happens.

Our study on mineral nutrition of pulpwood species is an example. White and black spruce, jackpine and western hemlock are being grown under controlled conditions in a greenhouse. Some are fed the complete solution containing what appear from the work of previous investigators the optimum proportions of all the essential and trace elements. Three lower levels (a tenth, a hundredth, and nil) of each of four of the essential elements have been supplied other groups of seedlings germinated from the same seed source.

Figure 4 shows the effect on white spruce seedlings, grown one year in the greenhouse, of deprivation of each of nitrogen, magnesium, phosphorus and potassium as compared with those receiving the complete solution. The effects of the other essential elements will be studied later; series with calcium, sulfur, iron and manganese are currently being started. Dry weights of the seedlings supply the base for comparison.

One objective is to determine in color at different periods of their development and foliar analyses have been made. Eventually, it is hoped to prepare a field manual as a guide to the forester in diagnoses.

Another phase of this study consists of factorial fertilizer studies in minerally deficient stands. Experiments have been established in two stands to date, and it is hoped to initiate an additional experiment each year. Each experiment includes a series of sample plots to which different fertilizers are applied to measure response. For example, nitrogen, phosphorus, potassium, magnesium and calcium were applied separately, in suitable replication, to different plots in the first experiment.

In a small side experiment to help get company foresters to look for mineral deficiencies, we have furnished fertilizer pellets to 26 cooperators in our supporting companies. The growth and survival of seedlings planted with a pellet in the planting hole are then measured and compared with those seedlings not so fertilized. At the end of two growing seasons after planting, no significant differences have appeared in survival (ranges between 82 and 85%, regardless of treatment). However, on 26% of the plots, the in-

crease in leader length attributable to pelleting is 20% or greater (20 to 54%).

Many of the company limits in Canada are located in Boreal forests and most of these forests are associated with mor, or undecomposed, humus in one of its many variable forms. Both company and government operating experience and special studies have illustrated repeatedly that the forms of more humus occurring in the regions which have a more continental climate have poor seedbed properties and poor timber-growing characteristics.

The Institute is studying the characteristics, functions, development and influence of mor humus on forest sites of varying productivity, species cover and age, and assessing the effects of certain silvicultural treatments on the growth of tree species on these sites.

The first randomized block experiment of 18 fifth-acre plots was established in a 50 year old, dense, black spruce stand in northern Ontario, where the average DBH was only 3.5 in. Treatments included application of nitrogen fertilizer, hoeing of the humus layer using Pulaski tools, and application of lime separately and in combination with nitrogen fertilizer. Soil, humus and tree (wood, bark, needles, roots) samples were collected and analyzed separately for nitrogen contents to determine the nitrogen cycle before and after treatment.

One of several side experiments in the greenhouse with seedlings taken from the area and grown in humus from the area has used separately labelled ammonium nitrate fertilizer to see whether the seedling takes up nitrogen more readily in the ammonium or in the nitrate form. This project will be extended in the near future to attempt to alleviate the development of hardpan conditions in jackpine cutovers.

It is hoped that the results from studies of this nature will furnish the forester guide lines for prescribing silvicultural and cutting practices of pre-

World Developments Studied

by panel which probes production, methods and markets

CANADA

By C. R. Silversides
Abitibi Power and Paper Co., Ltd.

SILVERSIDES

PULPWOOD PRODUCTION methods in eastern Canada today are a product of both environment and heredity. The methods used there are unique to the physical, economic, social and political conditions of the country.

In the main, pulpwood production in eastern Canada is by means of large-scale operations on timber limits leased from the government. These operations are still carried on from logging camps housing up to 275 men, located away from large centers of population. The scale of the operations, up to 50,000 cords annually from a camp and the forests operated, lend themselves to commercial clear cutting and the use of heavy machinery of high productive capacity. Labor is rapidly being organized in the woods, although there are several provinces where woods labor unions have as yet made little headway.

Today there is a strong trend to increased mechanization of almost all logging operations. The horse is disappearing. Year-round logging is becoming more common. Wherever feasible, commuter operations are being introduced. The dependency upon, or the influence of, climate is disappearing—autumn cutting, winter haul, and summer drive, while still the dominant pattern, no longer are absolute, as they were in former years.

The above is a general outline of pulpwood production methods. The factors which shaped its development into this pattern, so different from that of other parts of North America follow:

FOREST EXTENT

In Canada, out of a total of 1,707,000 square miles of forested area, there are some 955,198 square miles of productive forest area, which supports a timber volume of 4,749,-540,000 cunits. The annual depletion through all forms of logging and fire is 34,237,860 cunits. This is 7/10 of 1% annually. In the overall picture there is an indicated oversupply of wood.

It is interesting to note that of the 955,198 square miles of productive forest land, only 30% of this is occupied under lease, license, or private ownership. Some 672,889 sq. mi. of productive forest land is unoccupied. This excess volume of mature and over-mature forest militates against spending money on intensive silviculture except under certain limited conditions.

FOREST OWNERSHIP

In Canada the federal government owns and controls only nominal forest areas, mainly in national parks and Indian reserves. Our Dominion Forest Service is primarily a research organization. The forest resources of the country are vested in the provincial governments and are administered by them. Unlike the United States, Canada did not alienate the greatest part of its forest lands and today 91% of the productive forest land is owned by the state.

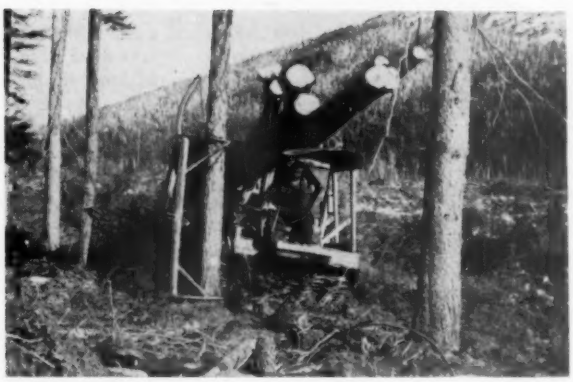
The pulp and paper industry is dependent on forest lands on which they have no title except a right to fell trees and remove them. Large timber limits are obtainable for varying periods, depending upon the government of the province where they are located and are renewable usually as long as the individual or company concerned lives up to its agreement with the government. In British Columbia on Crown lands, large management licenses are granted in perpetuity, while in Quebec all timber

dictable response. Field trials will be required to prove their worth to his specific area, but meanwhile he will be able to recommend treatment with a fair degree of assurance.

In Canada we are just beginning to come to grips with our needs for woodlands research. There are only a handful of research foresters in all our companies. But when we realize that over 150 individuals from company woodlands departments are carrying out experiments on their own which they reported to us, not to mention the perhaps even larger number who did not report, we can be encouraged. ■

References

[1] Nono.: Canada Forestry Branch. Annual report on forest research—year ended March 31, 1960. *For. Br. Can.*, 1960. pp. 69. 10 photos, 2 charts.
[2] Anon.: Canada Forestry Branch. Program of work, 1960-1961 of the Forest Products Laboratories of Canada. *For. Br. Can.* 1960. pp. 90.
[3] Anon.: Canada—Pulp and Paper Research Institute. Directory of current woodlands research and experimental work in the Canadian pulp and paper industry. [Revised annually, registered circulation].
[4] Bennett, W. D. Logging atlas of eastern Canada. *Woodl. Res. Index, Pulp Pap. Res. Inst. Can.* No. 103, March 1958. pp. 109, 46 figs., 21 refs.
[5] Besley, L. Forward with forces in the forest. *Preprint, Soil Conserv. Soc. Amer.* 10th Ann. Mtg. Aug. 28-31, 1960. pp. 21, 6 tbls.
[6] Besley, L. A preliminary national program of forest fire research for Canada. *Pulp Paper Mag. Can.* 60(10) Oct. 1959 (279 . . . 90).
[7] Moore, R. J. A directory of botanists in Canada. *Plant Res. Inst., Res. Br. Dep. Agric. Can.*, 1959. pp. 99.
[8] Preble, M. L. Development of forest insect research and control in Canada. *J. For.* 57(4) April 1959 (253-9).



VERSATILE harvester does many jobs.

TRACK-TYPE wood hauler is common in Canada.

limits are leased on an annual basis, renewable each year.

This forest policy has worked out fairly well over the years, and will no doubt be followed for years to come. There are some drawbacks, not the least of which are policies on private roads over public lands, disagreement as to the equity in the future crop if artificially regenerated on Crown lands, and other items.

FOREST CONTROL

All pulpwood production from government lands is carried out only after cutting plans in detail are approved by the provincial Forest Services. In Ontario and Quebec, at least, a condition of receiving a license is that the lessee will submit a detailed forest management plan acceptable to the government prior to operating the limit and periodically thereafter and the right to cut on a continuous basis remains dependent on complying with the accepted management plan.

This control of harvesting operations by the government is very real, and operations are quickly closed out if they are unacceptable to the government.

ECONOMICS

The pulp and paper industry in Canada, predominantly newsprint, is dependent upon exports to United States for its livelihood. The industry is what it is, where it is, as a result of United States action. The American pulp and paper industry in the northern states, taking cognizance of the immense spruce forests and water power sites in Canada, decided it would be good business to convert their own mills to more profitable grades and have newsprint manufactured in Canada. To make this stick, a tariff wall was erected against all paper products except newsprint, which is tariff-free.

Recently there has been a resurgence in newsprint manufacture in the United States, as methods for utilizing Southern pines and other species have been developed. The newsprint manufacturing industry in the southern United States has a tremendous economic advantage over that in Canada, both in wood cost and in transportation cost of raw and finished product.

CLIMATE AND PHYSICAL CONDITIONS

Climate in Canada has had a great effect on the logging methods that have evolved there. Historically, in eastern Canada, wood has been cut in the late fall and early winter, hauled in the winter over frozen roads on muskeg and lake ice, and floated or driven on lakes and rivers to the mills during the summer months. This cycle controlled the delivery of wood to the mills and the average period between felling and utilization by the mill was 18 months.

Today there is a conscious and successful effort to reduce the effect of

climate on operations, and also reduce the period of the delivery cycle. This has only been made possible by technological developments in machines and methods. With new road building and transport equipment, both tracked and wheeled, there is a marked trend to year-round operations and land delivery of wood in both summer and winter.

SOCIAL

In the past, logging has been a cyclical occupation, normally running counter to agriculture and fishing. The result was that most of the loggers were parttime farmers or fishermen. This was fortunate for those immediately concerned and for the economy as a whole. Today with concentrated effort being made to put logging on a year-round basis, this inter-relationship of labor is disrupted.

On top of this change, there are rapid changes taking place in the class of labor required in the forest. The machine operator is replacing the general laborer. Bullwork is now being done by mechanical horsepower. The professional year-round logger is becoming more and more prevalent. Logging is the chosen way of life for these men, not the means to a cash crop to round out their income from some other source of livelihood.

With the exception of New Brunswick, Nova Scotia, and a large part of Quebec in eastern Canada, large-scale logging operations are nearly all unionized. On the west coast the union history goes back a long ways, in eastern Canada only to the second world war.

Unions are accepted by most managements and detailed union agreements cover about 50% of the loggers in Canada. While unions tend to claim all the credit for the present improved conditions in the industry, management deserves most credit.

Logging is becoming more and more an industrial production operation and less and less a way of life. The passing of the horse from the scene has had a great effect in this regard. Formerly the pace and productive capacity of the horse set the tempo of woods work—it tended to be somewhat leisurely and was conducted in daylight hours only. Now with machines setting the pace there is a noticeable increase in tempo and efficiency as mechanical power takes over the more arduous part of logging and work day and night, when so required.

METHOD

Large underdeveloped areas of timber, away from centers of population, have necessitated costly developmental programs for timber harvesting —roads, villages, railroads, logging camps, fleets of ships, in short all the facilities to get men and supplies into the forest and pulpwood out of it—all at the cost of the pulpwood producer in question. This situation exists to a limited degree in the New England states, but has almost disappeared from the Lake States and the Pacific Coast. These conditions necessary for pulpwood production raise many social problems not found elsewhere—the abnormal social life of men living in large numbers in camps rather than at home, susceptibility of men in these circumstances to labor disturbances, the effect of cyclical operations on labor under these conditions.

Concentration of labor results in concentration of logging operations. Concentrated logging operations lend themselves to the use of high-capacity large costly equipment. This is a characteristic of Canadian limit pulpwood production today.

About 34% of the pulpwood produced in Canada is purchased from other producers by the consuming mills. In British Columbia at Vancouver, there has been an active log market, the only one of its kind in Canada, but this is declining as a result of companies more and more doing their own logging.

In eastern Canada there is no commodity market in pulpwood. Here wood is normally purchased through brokers or directly from the larger pulpwood producers. Usually such pulpwood is produced to specification after a contract has been signed—it is not usually produced by individuals as a product to be sold to the highest bidder on the open market after it is made. It is not produced by professional loggers but usually serves as a cash crop for farmers who are part-time loggers. ■

SOUTH AMERICA

By A. C. Shaw
Champion Paper & Fibre Co.

SHAW

A LITTLE MORE than a year ago Champion's Brazilian subsidiary, Champion Cellulose, S.A., began production of bleached sulfate pulp from eucalyptus at its newly built mill at Mogi Guacu, Sao Paulo, Brazil. Wood production preceded mill operations by several months and since it is principally eucalyptus, my remarks will be confined to those operations in the state of Sao Paulo.

Brazil, as is well known, is the largest South American country, its total land area being somewhat in excess of the United States excepting Alaska. Brazilian settlement preceded that of the United States by more than a hundred years; yet due to many adverse factors much of Brazil is still unoccupied.

Land is still Brazil's greatest resource. There are millons of unoccupied acres suitable for development and there are even larger areas whose utilization is certainly in the distant future. At the same time, there are considerable areas of exhausted agricultural lands.

While there are numerous small agricultural holdings, the economy is essentially plantation operations, many of which are very large by our standards, with the principal cash and export crops being coffee, cotton and sugar.

The southern states, particularly Sao Paulo, have supported some industry for many years. Much, if not most, of it has been developed by Brazilians but in recent years many foreign firms, first U. S., followed by the Germans, British and Italians, have established plants in Brazil. These are largely concentered in the state of Sao Paulo which is quite well served by rail and air transport and is engaged in a highway construction program of considerable magnitude.

There is a definite shortage of professional and highly skilled industrial workers as one might expect in a country with an agricultural economy but skills are by no means entirely lacking. Brazil has attempted more labor benefits through legislation than we. Its governmental expense is heavy due to high administrative costs

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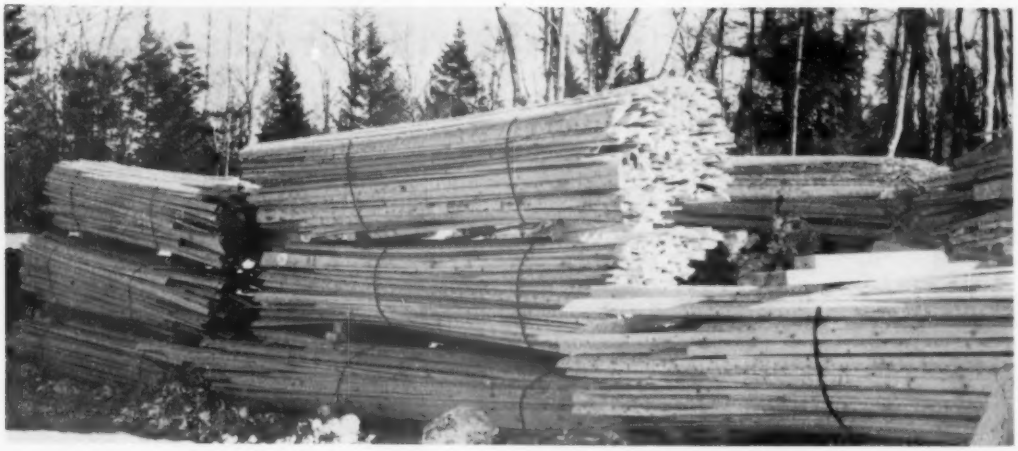

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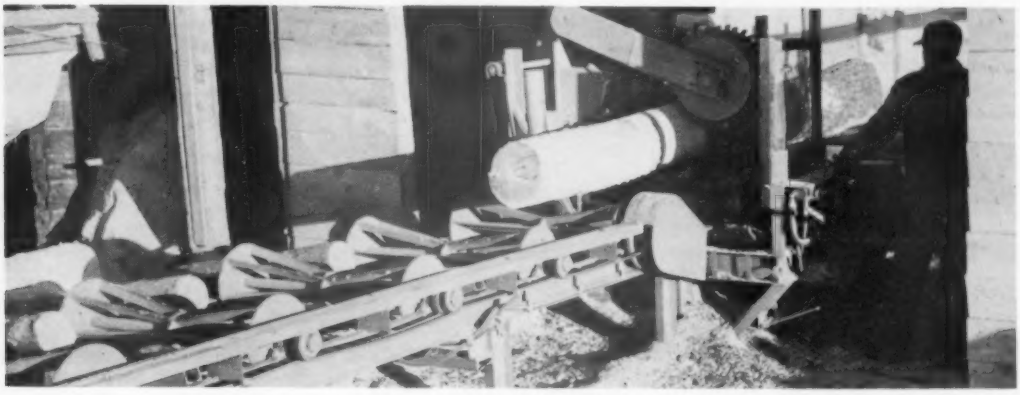

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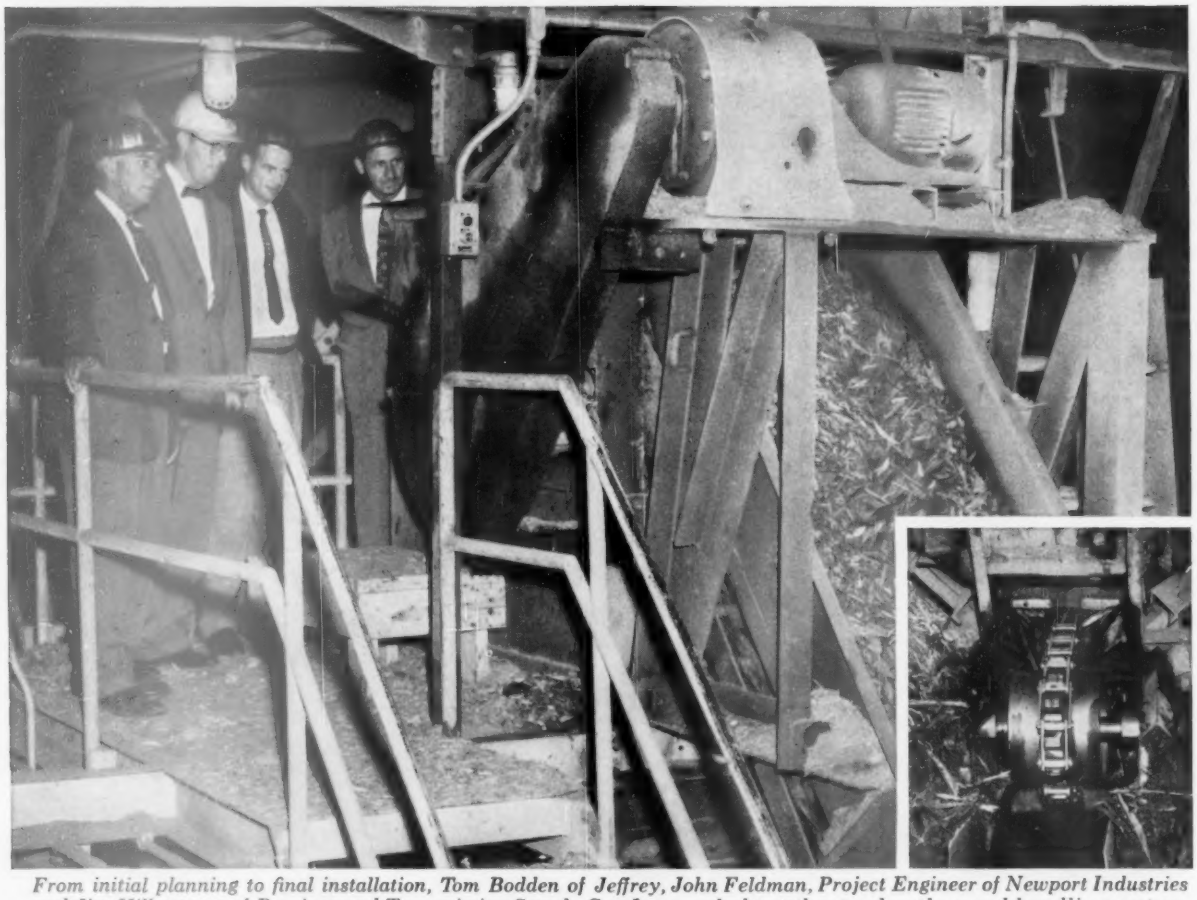
Project profits from teamwork: shows how Jeffrey works with distributor, customer



From initial planning to final installation, Tom Bodden of Jeffrey, John Feldman, Project Engineer of Newport Industries and Jim Hillencamp of Bearings and Transmission Supply Co., Inc., worked together to plan the wood handling system. Working closely with the planning team was Mechanical Superintendent Byron Campbell.

Newport Industries Division, Heyden Newport Chemical Corporation, designed a new system for handling pine stumps and wood chips. They called Bearings and Transmission Supply Co., Inc. of Pensacola, Florida, for help in selecting equipment. This Jeffrey distributor, in turn, called in the nearby Jeffrey engineer and the three combined their knowledge to make the project a task force operation.

The customer knew what he wanted. The distributor knew where to get it. The Jeffrey materials-handling expert knew the products that would deliver—Jeffrey standard chain, sprockets, takeups and idlers. The combination produced the highly efficient conveying system that now serves Newport's Pensacola plant from woodyard to processing.

This teamwork can help you, too. To get it, just call your nearby Jeffrey Distributor. He carries a convenient inventory to meet your needs. His men are trained to help you on the spot. He is backed up with the technical know-how of the local Jeffrey engineer. He is at your service. The Jeffrey Manufacturing Company, 809 North Fourth Street, Columbus 16, Ohio.

JEFFREY

If it's conveyed, processed or mined, it's a job for Jeffrey.

coupled with losses in railroad and coastal steamship operations.

The country has experienced severe currency depreciation and inflation due to governmental expenditures in excess of tax receipts and heavy overseas purchases of oil, automobiles and various manufactured items.

This has served as both a spur and a brake on industrialization, since it has resulted in a drive for industries to produce the essentials and the luxuries of modern living, to correct the imbalance of currency flow and at the same time it has prevented the accumulation of sound fluid capital essential to the financing of such enterprises. One finds it most difficult to assess their economic structure and to evaluate their problems in our terms.

Champion's Brazilian mill is approximately 100 miles north of the city of Sao Paulo and lies just inside the Tropic of Capricorn at an elevation of approximately 1700 feet. The climate is very good with rainfall of 50-60 inches per annum, the dry season is in the cool period of the year, frosts are extremely rare and maximum summer temperatures rarely exceed 100°. The winters are milder and the summers cooler than the extreme southern United States.

All of this particular area has been settled and occupied for more than 150 years and the better soils have long since been preempted for agriculture. However, much of the poorer or third rate soil is capable of producing excellent stands of eucalyptus and looks promising for Southern pine.

The principal wood species is eucalyptus, which was introduced about 60 years ago. Its culture and management have been highly developed by the agronomists of the Paulista Railroad. They have gone much farther in clone selection and development than we in this country.

Growth is very rapid. On the better soils, trees will attain a diameter of 12 in. and exceed 100 ft. in height in 12 years. At 35 years, diameters are 24 in. or more and heights exceed 150 ft.

Brazilian planting measures are more intensive than ours. Land is cleared and clean cultivated before planting at a customary 2 meter spacing. Plantations are cultivated for the first two years. Leaf cutting ants must also be eliminated. Brazilian tree planting partakes more of the nature of horticulture than forestry.

The cutting cycle for fuel wood is 5 to 7 years. Eucalyptus sprouts abundantly and if the sprouts are reduced to 2 to 4 per stump the second cut frequently equals and occasionally exceeds the first cut.

The yield declines with successive later cuts and there is some question as to whether or not a fourth cutting cycle is worthwhile. Growth varies from 1 to 7 cords per acre per annum with site and species or strains being the principal determining factors. Consequently, yields at time of cut vary extremely. Individual cuts will vary from 5 to 40 cords per acre.

The original forests and brush lands of this portion of Brazil were exhausted for fuelwood about the time eucalyptus was introduced. The principal large consumers of wood fuel were the railroads, the brickyards, the sugar mills and other industries. Secondary uses are poles, pilings, crossties and a very limited amount for lumber. Charcoal and domestic fuel are likewise important items.

The wood is dense and hard, being somewhat in the range of our heavier hardwoods. Fuelwood is customarily cut in one meter length using only the axe. The best cutters make 1 to 1½ cords per day. It is piled for measurement where cut and transported to the railroad or consuming plant by truck.

It is difficult to change established methods or customs. Our specifications call for 2 meter wood, barked in the woods, with minimum diameters of 10 centimeters or approximately 4 in. Eucalyptus barks readily and barking consumes about half the labor of cutting. Occasionally there is a fuel wood clean-up of the smaller material following the cutting and removal of the pulpwood.

Plantation topography varies from level to extremely steep slopes on abandoned coffee lands. Wood is either manhandled to the truck road or transported there on two-wheeled log carts pulled by two yokes of oxen and carrying 1 to 1½ cubic meters or between ¼ and ½ cord.

Rail cars are small on these one-meter gauge railroads and have a capacity of 6 to 10 cords. Since rail deliveries have proven somewhat uncertain, we place our major reliance on truck delivered wood.

At one time American-made trucks were dominant but they are now largely supplanted by Brazilian-made Mercedes and Fiats of 10 ton capacity. General Motors and Ford are now making trucks in Brazil and may well stage a comeback.

There is an abundance of labor and currently wages, in terms of U.S. dollars, are approximately the same as they were in the southern United States prior to World War I. This militates heavily against mechanization at the present time.

However, we have already learned that we cannot build woods roads rapidly enough with hand labor to keep up with production and have consequently employed bulldozers for this purpose. Equipment is expensive. Trucks and tractors cost twice as much as they do in the States and idle time, due to lack of replacement parts and repair facilities when breakdowns occur, is a further bar to the widespread use of machines at present.

We are attempting to introduce the Sandvik bow saw but have met with the usual resistance accorded a new tool and as yet have been unable to develop skilled filers essential to the use of this tool.

Parana pine is operated in similar fashion to eucalyptus except that in the pine region the two-man x-cut saw, all cutters and no rakers, is the felling and bucking tool.

Much of the wood production is done by the land owners who employ cutters and peelers on a piecework rate. Oxcart hauling is usually on a day labor rate with the land owners supplying the oxen. Trucking is both by contract truckers and by plantation owner trucks with the former predominating. The company has a very few trucks of its own.

Professional wood-producing contractors are comparatively few in our territory. We are in the early stages of developing such a system. Present methods of wood production remind one of brickyard and tobacco wood production in the lower South during the 20's except, of course, that the motor truck is of present day vintage.

Labor is willing but since the average Brazilian is much smaller than North Americans, they cannot handle wood at our rate of labor output. Foremanship is as much or more of a problem than here in the States.

It is probable that our first modification of present methods will be to introduce the bulldozer for temporary road construction since hand labor cannot accomplish the job with sufficient speed, although costs may be lower. Next, we must substitute the saw for the axe and this will take some doing. Further mechanization will be slow due to factors discussed earlier. The basic problems of organization, scheduling and cost control are quite in common with ours here in the States even though they may appear outwardly dissimilar. ■

RUSSIA

By Dr. Alex J. Panshin
Michigan State University

PANSHIN

BEFORE DISCUSSING pulpwood harvesting and consumption in the U.S.S.R. it may be helpful to review the forest resources picture in that country. This information is summarized in Table 1.

Forests in the Soviet Union occupy approximately 50.5% of the total land surface, or some 2,795 million acres. Of this acreage 2,100 million are designated as "commercial." This compares to 529 million acres so classified in the United States. Twenty-one percent of "commercial" forests are in European U.S.S.R., where the bulk of the population is concentrated, and 79% are in the sparsely populated regions of Asian U.S.S.R.

The forest areas in the Soviet Union are said to support an estimated 2,812 billion cu. ft. of wood, compared to 548 billion cu. ft. in the United States. Of this volume about 86% are softwoods and 14% hardwoods. In contrast, our forests support 69% of conifers and 31% of hardwoods.

The distribution of the U.S.S.R. forest stock in the fully stocked areas by acreage, volume and species is presented in Table 2. It should be noted that 40% of the stocked forest acreage and 38% of timber volume is larch. Of other major species, Scotch pine occupies 16% of the stocked area and represents 20% of volume, spruce 10.6 of acreage and 14% of volume, Siberian nut pine 4.7% of area and 7.7% of volume and fir 3.4% and 5.6% of volume.

The principal hardwood species are birch, which occupies 13.5 of the forest area and represents 9.0% of the total timber volume, and aspen with 2.1% of area and 2.1% of volume. Other important hardwoods are various species of oak, beech, alder, basswood and poplar.

Most of the larch is found in Siberia, while Scotch pine and spruce are distributed throughout the coniferous belt of the country. This geographic distribution of coniferous species has an important bearing on present and future location of pulp and paper mills.

Before new construction of mills was started a few years ago, all of the pulp and paper capacity in the Soviet Union was concentrated in European Russia, mostly in the northern regions and in the Ural mountains. The Soviet pulp mills depend almost exclusively on spruce for sulfite and dissolving pulp, and Scotch pine for sulfate pulp as their raw material. As far as could be determined from the available information, utilization of larch for pulping is still in the experimental stage; appreciable quantities of hardwoods have not been used.

Considerable interest has been indicated recently in the utilization of straw and reed as raw material in the agricultural regions of southern Ukraine, north Caucasus and northern Kazakhstan. Use of reed, which grows extensively in the deltas and valleys of many southern rivers, is expected to increase to more than 3 million tons by 1965. A number of small pulp mills, with 15 to 60 thousand ton annual capacity, are projected in the current seven-year plan for this purpose in the forest deficient regions. Output of these mills is expected to be 480 thousand tons of pulp a year.

Considerable attention will also be paid to supplementing round pulp wood with sawmill residues and chips developed from culls and low grade timber.

In planning new capacity the stress is placed on integration of the various wood-consuming industries, so that maximum utilization of raw material, including wood residues, will result.

An example of this approach is the Bratski wood processing combine in western Siberia. The construction of this industrial complex began in 1958, and it is estimated that it will take five years to complete.

This integrated operation will include a large sawmill, a furniture factory, a plant for prefabrication of houses, a sulfite mill, with a yearly capacity of 200 thousand tons of dissolving pulp, a 280 thousand ton liner board pulp mill, a particle board mill with 100,000 cu. mt. annual output and a sulfite alcohol and fodder yeast plant. This construction will also include a city for at least 100,000 inhabitants.[1, 7]

FOREST AREA - MILLION ACRES

	U.S.S.R. ACRES	%	U.S.A. ACRES
TOTAL FOREST AREA	2,795		784
COMMERCIAL	2,066	100	529
IN EUROPE	448.7	21	
IN ASIA	1,617	79	

GROWING STOCK - BILLION CU. FT.

	U.S.S.R. BILLION CU. FT.	%	U.S.A. BILLION CU. FT.	%
TOTAL GROWING STOCK	2,812	100	548	100
IN EUROPE	651			
IN ASIA	2,161			
CONIFERS	2,419	86	377	69
IN EUROPE	477			
IN ASIA	1,942			
HARDWOODS	393	14	171	31
IN EUROPE	174			
IN ASIA	219			

TABLE 1. Forest land and growing stock in the U.S.S.R. and U.S.A.[7]

SPECIES	STOCKED AREA* MILLION ACRES	%	VOLUME MILLION CU. FT.	%
LARCH	677.8	40.5	1,004,698	38.0
SCOTCH PINE	270.6	16.0	531,130	20.0
SPRUCE	178.2	10.6	373,592	14.0
SIBERIAN STONE PINE	79.3	4.7	206,060	7.7
FIR	57.1	3.4	147,685	5.6
OTHERS	50.1	2.9	18,010	0.6
TOTAL CONIFEROUS	1,313.1	78.1	2,281,175	85.9
BIRCH	226.8	13.5	239,715	9.0
ASPEN	35.8	2.1	57,563	2.1
OAK	21.0	1.2	24,861	1.0
BEECH	6.2	0.3	18,258	0.7
ALDER	4.9	0.3	5,436	0.3
BASSWOOD	4.7	0.3	7,416	0.2
POPLAR	3.2	0.2	4,167	0.2
OTHERS	67.1	4.0	12,996	0.6
TOTAL HARDWOODS	369.7	21.9	370,414	14.1
GRAND TOTAL	1,682.8	100.0	2,651,589	100.0

* STOCKED AREAS INCLUDE ONLY THOSE AREAS OF "COMMERCIAL" FOREST WHICH SUPPORT TIMBER IN EXPLOITABLE VOLUMES.

TABLE 2. Distribution of stocked area and volume by species.[7]

Pulpwood Production Machines in Use in U.S.S.R.

"DRUZHBA" portable gasoline chain saw weighs 27 lbs., has maximum 24-in. chain, 3 hp engine. Stand-up frame permits operator to work erect and use knee to exert pressure on the cut.

TD-T40 CRAWLER tractor, with tilting deck apron, power winch behind cab and A-frame fairlead mounted on the apron. These four pictures all from Mostovaya tractor and truck operation, 190 miles from Moscow.

TD-T60 CRAWLER tractor with Hiabob loading boom, cable lift and hydraulically-controlled side-winging gears. Rubber-tired roadless trailer is attached to center plate over tractor transmission. The machine is driven close to standing tree, timber cutter fells tree across the trailer reach pole, with tractor driver using pike pole to guide direction of fall.

EXPERIMENTAL tree harvesting machine. Heavy front-end knee-action claw grasps tree 8 or 9 ft. above ground and fastens cable at this point. A 30-in. hydraulically controlled circular saw, operating horizontally on knee-action steel arm, severs tree. Rear-end winch cable pulls tree over top of tractor on toothed log cradle which can hold 10 to 12 trees.

This complex will consume about 1,400,000 cunits of wood a year, of which about 900,000 cunits will be used as pulpwood. All of this wood is available at a maximum distance of 200 km (125 miles) from an area of some 60,000 sq. km. At least four other similar combines are now in the planning stage.

The current production of the Soviet pulp and paper industry and the effect of new construction and modernization by 1965 is shown in Table 3.

Though the percentagewise increase in production of pulp, paper and board is quite impressive, it is less so when considered on a per capita basis. Per capita consumption of paper and board in 1958 in the Soviet Union was about 31.0 lbs., as against 405 lbs. in the United States.

Total consumption of pulpwood and the breakdown by species is not available. The 1955 consumption of wood by pulp mills in the U.S.S.R. was reported as about 10 million cu. mt., or an equivalent of about 4 million cords. On the basis of known production figures of paper, board and dissolving pulp, it may be assumed that pulpwood consumption in 1958 was about 5.5 million cords and in 1960 perhaps in excess of 6 million cords.

To understand how this pulpwood is procured a brief explanation must be made of the administrative set-up of forest management and forest exploitation in the U.S.S.R.

With the exception of a relatively small acreage, comprising less than

PRODUCTION OUTPUT	1958	1965	INCREASE % OF 1958
PULP (THOUSAND METRIC TONS)	2,091	4,844	59%
PAPER (THOUSAND METRIC TONS)	2,220	3,530	131%
PAPERBOARD (THOUSAND METRIC TONS)	710	2,828	300%
HARDBOARD (MILLIONS SQ. METERS)	36	300	734%

TABLE 3. Seven-year expansion plan for pulp and paper industry*

one percent of the total forest area assigned to the collective farms, the remaining forest area is managed and exploited through the various government agencies.

The administrative set-up is considerably complicated by the fact that a number of drastic changes have been made in recent years. Prior to 1957 the Ministry of Timber Industry, was responsible for all phases of forestry. In 1957 this ministry was abolished. In its place the Department of Forests and Shelterbelts was created in the Ministry of Agriculture to handle forest management, protection and stumpage allowances. Timber cutting and certain phases of wood processing, however, were made the responsibility of another agency, the Forest Industries and Forest Products, located in the State Planning Commission.

Under this system most of the cutting was executed by the so-called "permanent" logging enterprises, which owned all of the logging equipment and machinery, built roads and operated wood concentration yards, called "the lower yards." These enterprises also constructed complete villages, with schools, hospitals and recreational facilities, to house the labor and supervisory force.

Cutting areas ranged in size from 30,000 to 70,000 acres, allowing for 10 to 20 year operations in the areas visited by the American delegation in the north European regions.

The division of responsibilities between two government agencies and arbitrary stumpage allowances to the logging camps have created serious problems. The chief issue was that the short, 10 to 20 year cutting cycles meant incomplete amortization of capital outlays which, if allowed to occur, would amount to 2 to 3 billion rubles loss in the next 10 to 15 years. Divided responsibilities for reforestation and fire protection were other serious problems brought about by this system.[6]

As a result of these difficulties a single Main Forest Management Unit was created in 1959 in the Russian Soviet Federated Republic, the largest of the Soviet Republics, in which almost 94% of the total forest area of the U.S.S.R. is located. This new organization, first tried out in the Lithuanian and Latvian Soviet Republics, is subordinated to the Council of People's Economy and is responsible for both the management and the exploitation of forests. This newest move apparently signifies ascendancy of the forest exploitation interests over those of forest management and conservation.

A strong trend to mechanization of logging, timber transport and timber processing is evident in the more efficiently operated logging units. For instance, the United States delegation was told that 90% of what might be described as "commercial" timber and pulpwood cutting is done with chain saws, that wood transportation from the forest to concentration yards is 60% by trucks, 30% by narrow-gauge railroad and 10% by tractors, and that delivery of pulpwood to the mills was 50% by water, in rafts containing 2,000 to 10,000 cords, 30% by mainland wide-gauge railroads and 20% by other unspecified means.[7]

Tree length logging prevails in most large-scale woods operations; cut trees are skidded with tractors or by cable system to the landing, where they are loaded either on trucks or narrow gauge railroad cars for delivery to concentration yards. In some cases trees are delivered with tops and all, in others they are topped and limbed in the woods. In concentration yards tree stems are reduced to lengths determined by species, quality and intended use. More conventional pulpwood cutting operations are also in existence, but in every instance they are organized as camps administered by the government.

The vast majority of the logging and pulpwood cutting operations in the Soviet Union has no direct tie up with the manufacturing plants, i.e., they are merely suppliers of raw forest products. There is a recent trend, however, toward partial integration of logging and manufacturing operations by setting up manufacturing facilities, such as box shook or house prefabrication plants at the lower (concentration) yards. In the newest installations, such as the Bratski combine, complete integration of woods and plant operations is contemplated.

The stumpage prices charged to the logging units, and the prices paid by the pulp mills for pulpwood and other raw materials are established by a central government agency and therefore these costs have little or no relation to the actual costs incurred by the individual operations.

One aspect of this system of pricing is that cost of raw materials represents more than one-half of the total production expenditures at pulp mills. These costs have been increasing in many plants due to a large extent to the cost of pulpwood transportation from remote regions.

For instance, an example is cited of the Kaliningrad pulp mill which lost 48.9 million rubles in 1958 mainly because of the cost of reloading pulpwood in water transportation used by this mill. The result was that cost of 1 cu. mt. of wood transported by wa-

KRESTZY TIMBER production and experimental unit, 250 miles north of Moscow. "Company" village at left; each frame house is occupied by two families—living area per family includes kitchen, storage area and one bedroom. Houses have electricity but no running water. Wood is used for heating and cooking. Clear cutting operation (right) in forest consisting of 40% spruce, 55% aspen, 5% Scotch pine. About 800 cu. m. of tree-length wood are cut per day, of which 10% (32 cords) is spruce pulpwood. At right is G. I. Mastobayev, director.

ter exceeded that of rail transportation for the same distance.[2]

It is notable that in the 1958 fiscal year 49% of all pulp and paper mills in the U.S.S.R. lost 646.5 million rubles, while the remaining 51% made 669.6 million rubles, resulting in a net gain of only 23.1 million rubles (about 2.31 million dollars).[2]

In addition to the high cost of raw material, additional reasons for losses sustained by pulp mills, chargeable to pulpwood, were: diversion of pulpwood for fuel, prevalence of knife barkers, resulting in losses of up to 20% of wood, and high incidence of hand labor in handling pulpwood.

Productivity of an average woods worker had increased from 0.34 cords a day in 1940 to only 0.36 in 1955. With introduction of mechanization it may be assumed that the output per worker has improved.

In one completely mechanized woods operation visited by the American delegation in the summer of 1959 the "norm" established on a piece work basis was about 2½ cords per man-day.[7] However, workers in this camp were Finns and the camp was rated most efficient in the region.

It must also be noted that in this case production refers to the tree lengths, which must be further processed at the lower yard, and that only a part was converted to pulpwood.

All the labor in the forest products industries is on a piece work basis. A central government agency sets the work quotas for each task, as well as the base pay. If the work quota is met a bonus is paid. An additional bonus is also paid for over-fulfilling the base quota, by an individual, the crew and by the entire production unit.

An example of how this system works was given to the American delegation at one logging operation.[7] Assuming that a certain number of cubic meters of timber cut per day for a six-man crew is the base work quota, each man then receives a 20% bonus if this quota has been met. For every additional cubic meter of timber produced the crew receives one and one-half times the base rate.

In addition, if the monthly production quota for the entire camp has been met, a further bonus is paid to every worker in the camp. A still further bonus is possible. This is paid to the camp which rates first among comparable units in the region for any given quarter of the year. An additional 112,000 rubles, for instance, had been received by this particular camp, for being first in production for the second quarter of the year.

Pyramiding of bonus payments makes it difficult to arrive at a real wage scale for any given classification of labor. The earnings of every worker are subject to wide fluctuation, since in most instances his take-home pay depends not only on his personal performance but also that of his crew and the entire working unit.

The picture is complicated still further by the fact that the workers may share in the so-called "profit" made by the camp or the plant. Again a government agency sets the base price for a given item produced or manufactured. The "profit" then for a production unit becomes the difference between the base prices and the operation costs. A certain percent of that goes into the director's discretionary fund that could be used for a variety of purposes, including improvement of the workers' housing, recreational and medical benefits, and paid vacations.

Information received by the American delegation, and confirmed by the Canadian group which visited the Soviet Union in November 1959, indicates that the basic wages for woods labor range from 800 to 1,200 rubles ($80 to $125) a month for unskilled and 2,500 or more rubles ($250 and up) a month for skilled. Supervisory staff receives a base salary of 2,000 to 3,000 rubles ($200 to $300) a month. In every case, however, opportunity exists for incentive bonuses that may augment basic wages and salary.[1, 7]

PULPWOOD STORAGE at Kondropod Newsprint Mill, Karelian Soviet Republic. Spruce pulpwood is rafted, cut to 1.25 m. lengths and barked in eight drum barkers. Land storage is provided for winter supply. Daily consumption is 800 cu. m. (314 cords), expected to rise to 2,500 cu. m. (980 cords) by 1965.

Some conclusions are justified from personal observations and data collected by the United States and Canadian delegations and information available in the Soviet publications.

(1) Forest resources of the U.S.S.R. contain an estimated 2,812 billion cu. ft. of timber, 86% of which are softwoods suitable for pulping. However, 77% of this timber volume is in the sparsely populated Asian regions, and 38% of it is larch, a species not yet used for pulping to any extent.

(2) Present pulpwood consumption in the U.S.S.R., based on the known pulp and paper figures, is probably about 6 million cords. Assuming that expansion of this industry, now in the planning stage, will be on schedule, raw material requirements should almost double by 1965.

(3) The principal species used for pulpwood in the Soviet Union are spruce and Scotch pine. Small quantities of hardwoods, principally aspen, are also used. The future plans call for utilization of larch, and increased use of hardwoods and wood residues. Considerable quantities of reed and straw will be utilized in the regions deficient in forest resources.

(4) A trend toward mechanization of all woods operations is in evidence. Division of administrative responsibilities, low labor productivity in the woods and inefficiency of transporta-

References

[1]Anon. Canadian Observers Visit Russian Industry, Pulp and Paper Magazine of Canada, Vol. 60(12), pp. 78-102, 1959 and Vol. 61(1), pp. 69-80, 1960.

[2]Bogdanova, E. G. and Nikonova, O. C. Must Liquidate Planned Losses of Industrial Establishments, Boumazhnaya Promishlenost, pp. 23-24, June 1960 (Russian).

[3]Bowles, W. D. Soviet Union Seven-year Plan Stresses Extensive Mill Modernization. Pulp and Paper Magazine of Canada, Vol. 60(11), pp. 88-92, 1959.

[4]Ditkovskii, A. C. Pulp and Paper Industry of the U.S.S.R. in the 1959-1965 years. Boumazhnaya Promishlenost, pp. 23-24, Sept., 1959 and pp. 23-24, Oct. 1959 (Russian).

[5]Lupye, H. A. Export and Import of Pulp and Paper Products in 1959. Boumazhnaya Promishlenost, p. 28, Sept. 1960 (Russian).

[6]Mastobayev, G. I. and H. S. Sin'gov. Questions of Unification of Forest Management and Forest Exploitation. Central Sci. Institute of Mechanization and Power in Forest Industry. Vol. XII, 1959 (Russian).

[7]U. S. Forestry Delegation, Forestry and Forest Industries in U.S.S.R. U.S. Dept. of Agriculture, Forest Service, 1960.

tion systems in the past accounted for the excessively high cost of raw material, delivered to the pulp mills.

(5) Stumpage and pulpwood prices are established by a central governmental agency and bear little relation to the actual costs of production.

(6) Wages are established on a piece rate basis, and are augmented by bonuses based on productivity.

(7) Since forest resources and all phases of production and scheduling are regulated by the government, the decision to offer pulpwood and pulp and paper products on the world markets also rests with the government. If expedient for political reasons, these products in quantities sufficient to unsettle international markets, and at prices not related to the actual costs, could be offered at any time. This could be done, however, only at the expense of maintaining low domestic per capita consumption. ■

ASIA

By R. E. O'Connor
American Paper & Pulp Assn.

O'CONNOR

BY WAY of general background, I had the good fortune last fall of attending, as a member of the delegation from the United States, the conference on pulp and paper development in Asia and the Far East, held in Tokyo from October 17 to October 31, under the auspices of the Food and Agriculture Organization of the United Nations (FAO) and the Economic Commission for Asia and the Far East (ECAFE).

Support for the conference was widespread, at least in terms of attendance, with 153 people representing 32 countries, including a substantial representation from the United States industry and government personnel. The conference basically constituted a comprehensive analysis of development needs and prospects over a short as well as longer range period, with the daily sessions devoted to discussion and consideration of many aspects of the pulp and paper industry in the area.

Regrettably, no detailed review of the technical aspects of the region's pulpwood procurement methods and techniques was included, although some reference thereto was included in the publication "Forestry in Japan" made available to the delegates through the courtesy of the Japanese Forestry Agency. As a matter of possible interest, some extracts from that report, which summarizes briefly Japanese wood procurement techniques, are published on this page.

Primary areas of concern to the conference related to the availability of sufficient capital investment, an adequate pool of trained personnel, and the availability of fibrous material supply to meet the projected needs of the region through the years 1965 and 1975. The latter aspect, to which substantial discussion and study were devoted, is the one to which I will devote my attention.

Quite obviously any appraisal of the adequacy of raw material supply can be meaningful only within the context of expected consumption requirements for the products based on the resource. It is appropriate, therefore, to refer briefly to a few of the pertinent statistics about the area.

Currently, for the region as a whole, there is an extremely low consumption of paper and paperboard now at a level of approximately 1½ kg per capita compared with a world average of approximately 22 kg, and particularly in sharp contrast to current consumption in the United States of approximately 200 kg per capita.

The total consumption in Asia and the Far East now is at a level of approximately 6½ million metric tons, with projections of estimated future consumption aggregating eleven million metric tons by 1965, and a level of 25 million metric tons reasonably to be expected by the year 1975.

This latter figure, incidentally, indicates that the region's requirements for 1975 would be roughly equal to the pre-war consumption of paper and paperboard of the entire world.

It should be noted that some of the delegates from the countries in the region regarded these estimates as being on the conservative side in light of fairly large-scale governmental plans to raise educational standards and literacy rates with attendant needs for substantially increased supplies of paper.

It was against this backdrop that the appraisal of the region's anticipated fiber needs was made. Information available disclosed that the Far East region has a somewhat limited and scattered reserve of coniferous forests, the fiber resource which has fed the spectacular expansion of the pulp and paper industry in the industrialized regions, and on which the industry, over the world as a whole, still depends for some 90% of its virgin fiber. Though this lack may have impeded it certainly has not prevented, a substantial growth in the pulp and paper industry in Asia and Oceania.

The list of fibrous materials actually being processed into paper in the Far Eastern region is longer and more varied than in any other region in the world. Asian skill and tradition, assisted often by Western technology, have led to the establishment of many important modern industrial installations, making use of bamboo, various other grasses, tropical and temperate hard woods, sugar cane waste, rice straw, and a wide miscellany of other argicultural residues.

Several of the many background papers of the conference noted that the level of technology related to pulping agricultural fibers and other fast growing fibers, such as reeds, is approaching the level of technology of wood pulping. They conceded that while the trend toward greater utilization of agricultural fibers is world wide, it clearly is most evident in areas such as the Far Eastern region, where the traditionally used pulpwood varieties are not available in adequate quantities.

With specific reference to the availability of various fibrous raw materials, the following general conclusions were reached:

WOOD. The prospects of supplies of short fibered wood pulp were generally better than long fibered pulp from conifers, but pulpwood from existing mixed tropical forests would in many cases be more expensive than such alternative raw materials as bagasse or rice straw. It was also likely to cost more than pulpwood from existing or potential plantations of indigenous or exotic fast growing species. It was felt, however, that tropical forests desirably should be studied further with a view to increasing their productivity of pulpable species with the possibility in mind also of greater utilization of wood residues.

BAMBOO. It was felt that bamboo pulp was likely still to be the main substitute for coniferous chemical

pulp, because in countries where both were available, bamboo would often be cheaper than pine. It was noted that resources for large-scale expansion of pulp production, were available in south Asia and continental South East Asia; with the largest untapped source, capable of yielding several million tons a year, being bamboo from Burma. The feeling was also expressed that bamboo from artificial plantations might prove even cheaper than that from natural stands.

GRASSES. Reference was made to the fact that the region currently contains many grasses and reeds which are suitable as pulping material. It appeared, however, that further investigation of the economics of their utilization would be necessary.

BAGASSE. The conclusion was reached that over most of the region, bagasse was likely to be the cheapest short-fibered material available in large quantities, as a result of which a considerable expansion of bagasse pulping was foreseen.

STRAW. It appears that straw is not likely to become an important raw material in the overall supply of the region but is, however, seemingly capable of supporting a limited expansion in small and medium sized mills in continental and insular South East Asia and in Taiwan.

The main conclusions reached, after a substantially detailed analysis of the various fibrous raw materials, were:

(1) Overall potential supplies of raw material are more than sufficient to cover estimated needs up to 1975 and even beyond.

(2) Each sub-region seems capable of satisfying its own needs, with the possible exception of East Asia.

(3) Except in East Asia, raw materials could be made available at prices comparing favorably with those in western countries.

(4) Three outstanding sources of supply exist; the untapped bamboo reserves in Burma; the industrial bagasse in South and East Asia, and existing and possible future plantations of broad leaved and coniferous species in continental and insular South East Asia and East Asia.

In light of the emphasis which has been placed on the utilization of agricultural fibers there might be some interest in extracts from a paper submitted by the Russian delegation to the conference which dealt in some length with the utilization of reed and other annual plant growth in their manufacture of pulp and paper. Incidentally, while Russia is not a member nation of the FAO, it does participate in the work of the Economic Commission for Asia and the Far East.

In the paper submitted by the USSR, reference was made to its newly announced seven-year plan under which several mills will be built in the 1960-65 period, with the manufacture of pulp, paper and paperboard from reed. These are substantial operations, one of which is planned for an annual production of 170,000 tons of paperboard and still another for 140,000 tons annually.

In their paper, the economics of the utilization of reed in contrast to pulpwood is set forth as follows:

"The average reed harvest being ten tons per hectare and the pulp yield comprising 60%, one hectare of reed jungle furnishes the raw stuff for six tons of corrugated container board. With an annual timber growth of two cubic meters, approximately 0.6-0.7 tons of pulp may be produced per hectare.

"Hence reed jungles are far more productive than forests. The high natural productivity of reed indicates the possibility of artificial cultivation on specially organized plantations.

"Calculations have shown that, harvested mechanically, the one ton of reed costs no more than a cubic meter of wood.

"Considering that one ton of corrugated board takes three cubic meters of hardwood, or two tons of reed, the outlay on raw material will be 30% less with the latter than the former. The construction outlay on pulp and paper mills on reed is also considerably lower than on wood."

While it is hardly to be expected that the pulpwood procurement techniques and methods of the U.S. will not have valid and more intensive application in the years to come in the Asian area, it is likely that a somewhat more varied pattern of procurement of the industry's fibrous raw material will emerge.

Such developments, therefore, unquestionably also would have some implications of interest to our own domestic industry. ■

Extract from "Forestry in Japan"—Production Technique

LOGGING

Summer logging during April to November is common in the southern part of the country. Logging in summer facilitates the peeling off of sugi and also the seasoning of logs. Winter logging during December to March is common in the northern snowy regions and has certain advantages, some of which are:

(1) Snow transportation is available.

(2) Disease and insect attack, also distortion and cracking due to drying, are minimized.

(3) Decay, especially in broadleaf trees, is largely prevented.

(4) Surplus labor in the farming slack season is available.

In large-scale enterprises, logging operations are done throughout the year.

In man-power felling, 90% of woodsmen use both an ax and a saw, and in power saw felling, it is only 10%. Most power saws are chain saws and recently the direct-drive system is more common.

SKIDDING

The prevailing skidding practice is 80% of manpower with hook, wood sledge, and snow sledge and 10% of skidding machine and tractor, and 10% by cattle. Since skidding by cattle on the ground causes log damage and requires heavy and dangerous labor and is likely influenced by weather, recently the mechanical skidding has begun to be widely used, and particularly the small skidding machine is more common which helps the larger machine in the operation. The tractor is also commonly used on the mild slope cut-over tract.

LOG TRANSPORTATION

Floating and rafting by stream flow was widely used some years ago, but has gradually diminished because of blocking of water courses by dam construction. Also transportation by oxen carts is replaced by cable way, tracks, forest railway, and trucks. The percentage of these operations is 22% by cattle, 76% by machines, and 2% by hydraulic power.

In transportation by mechanical power, cable ways in small-scale operation and tracks and forest railways in large-scale operation have been used but recently regardless of the magnitude of the operation, cable ways and trucks are widely used. Particularly, truck hauling is more available on highways and is expected to be more common in future. The existing tracks and forest railways are being replaced by trucks.

TIMBER STORAGE

Man-power has been widely used in other timber yards than the large-scale yard but recently in order to attain the higher efficiency of storing operation and intensive utilization of the yard, various machines particularly portable cranes and log-loaders are extensively introduced.

ORGANIZATION AND PROGRAM 1961-62

THE LONG-TERM objectives of the American Pulpwood Association are:

(1) To guide and help the pulpwood industry to grow and harvest pulpwood of the highest quality, in sufficient amounts now, and for future generations, at a reasonable cost.

(2) To serve the entire industry in Technical, Safety and Training, Statistics, Forest Management, and Legislative programs.

(3) To encourage all members to prepare now for the predicted increase in pulpwood consumption during the next 10 to 20 years.

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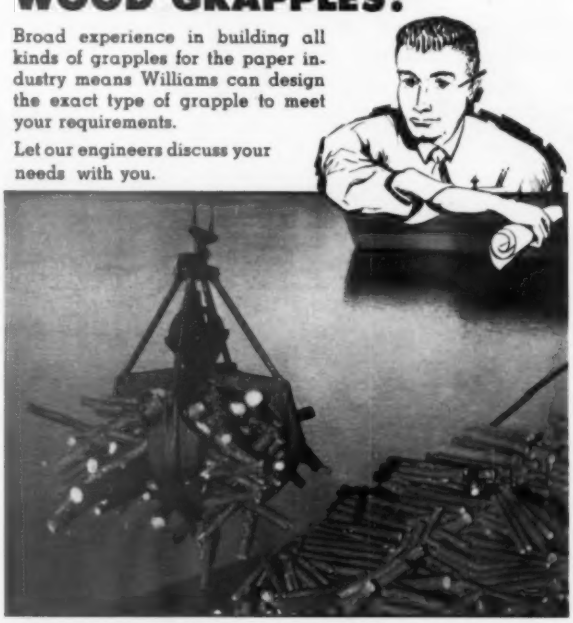

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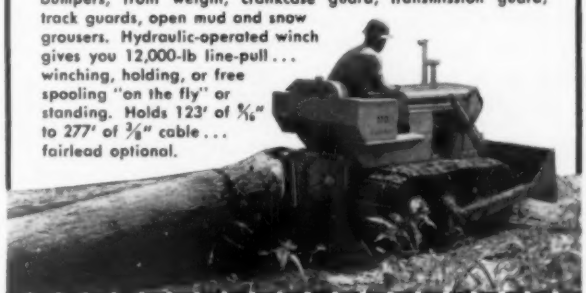

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REVIEW OF ASSOCIATION ACTIVITIES

WE CAN POINT to 1960 as a peak year for the consumption of pulpwood in the United States, the total being close to 40 million cords. As the industry climbed this peak, it showed considerable fatigue as it reached the top of the year. Most of us will remember 1960 as a year which showed: first, a high volume of sales for many companies accompanied by increased costs and lower profits for most in the industry and second, that the increased consumption in pulpwood was due to the entry of some new mills and some expanded mills. A glance at the statistics shows that much of the expansion has been in the form of pulpwood chips, giving a first impression that our total consumption of round wood might have decreased. Nationwide this is not the case, except in a few specific areas where there may be a concentration of saw mills. Even then, such a situation is likely to be temporary, once the potential for chips levels off.

At the present time, APA membership totals 214, including 58 consuming members, representing over 80% of all pulpwood consumed in the U.S. In short, the status of membership and finances have been improved during the past year. We hope to fill the vacancy created during the year by the resignation of Jefferson Keith, who is now Manager-Director of the Pressed Metals Institute in Cleveland, Ohio. Jobloads and responsibilities will need to be realigned during this next year.

One of the most significant developments that occurred during 1960 was the action of 17 pulp and paper companies in the southeast who pooled their interests in increasing the efficiency of pulpwood production in that area to form the Southern Pulpwood Production Research Project of the American Pulpwood Association. The research work for this project is being done by the Battelle Memorial Institute. The industry organization, promotion of interest and the financing aspects of this project have been handled through the American Pulpwood Association.

Members of the new administration in Washington state that conditions will get worse before they get better. If this prediction proves to be true and if the timing of better conditions as visualized by the majority of economists is correct, we should be headed for, or in the midst of, a real boom in our industry by the time our Association convenes again next year.

The activities of our standing committees and regional technical committees in guiding our five major programs during 1960 are covered separately.

Technical Program

The APA Technical Program covers three major areas of activity: (1) Regional Technical Committee meetings; (2) Special action projects, usually of a technical nature, designed to help solve current production problems; and (3) Publishing of Technical Releases. Our four Forest Engineers devote a majority of their time to this phase of the program. The year 1960 marked the twelfth year of this particular program. During this period too, there has been a steady growth of activities by the various committees. The Technical Releases prepared primarily by APA Forest Engineers and issued in 1960 are listed on this page.

A review of the important subjects

APA TECHNICAL RELEASES—1960

No.	*Subject*	*File*
60-R 1	The Natural Resource Road Program	6.33
60-R 2	Sources Of Forest Credit	0.23
60-R 3	Forest Fire Insurance	0.23
60-R 4	Management Control	0.2
60-R 5	The Schramling Tree Planter	2.56
60-R 6	Outside Storage Of Chips In The Northeast	4.35
60-R 7	Application Of Operations Research Methods To The Forest Industries	7.12
60-R 8	Consulting Foresters Can Help You	0.23
60-R 9	An Upper Michigan Aspen Pulpwood Operation	4.01
60-R 10	A Pulpwood Operation In The Central Upper Peninsula Of Michigan	4.01
60-R 11	A Pulpwood Operation In Northeastern Minnesota	4.01
60-R 12	A Northeastern Minnesota Pulpwood Operation	4.01
60-R 13	A Homemade Pump For Equipment Refueling	4.2
60-R 14	Removable Extension Stakes For Pulpwood Dray	4.32
60-R 15	A Jack Pine Pulpwood Operation in North Central Wisconsin	4.01
60-R 16	A Homemade Pulpwood Debarker	4.214
60-R 17	FWD Blue Ox Skidder (Progress Report)	4.3132
60-R 18	Pulpwood Price Trends In The Southeast	8.122
60-R 19	Analysis Of Workmen's Compensation Laws (Review)	0.22
60-R 20	The Fontan Back-Pack Sprayer	2.67
60-R 21	NOT ISSUED	
60-R 22	One-Season Snowshoe Harness	4.2
60-R 23	The Possibilities Of Microwave In The Forest Industries	7.85
60-R 24	Cable Masters	4.2
60-R 25	Lease Or Buy—Comparative Cost Of Equipment Acquisition	8.34
60-R 26	Recent Developments In Portable Harvesting Equipment	4.3
60-R 27	Atlantic Coast Line Railroad Chip Car	4.315
60-R 28	Saw Chips	5.6113
60-R 29	Southern Railway's Chip Car	4.315
60-R 30	The Production & Marketing Of Pine Wood Residues By Small Sawmills (Review)	5.355
60-R 31	Public Lands Stumpage—Appalachian Region	0.112
60-R 32	What Happened To The Montague Loader?	4.01
60-R 33	The Buschmaster—A Forest Management Tool	7.0
60-R 34	The Hiabob DF-8 Tree Length Loader	4.433
60-R 35	Radio Controlled Skidding Equipment	4.317
60-R 36	A Pictorial Review—Western Chip Handling & Transport	4.52
60-R 37	Palletization Of Truck Hauling In The NE U.S. & Eastern Canada—Its Development And Application	4.314
60-R 38	Truck Data—Classification, Identification, Etc.	4.314
60-R 39	Longview Fibre Company – Mechanical Chip Samplier	4.523
60-R 40	Tractor Cart—Swedish Tractor Development #3	4.313
60-R 41	Tractor Winch & Boom—Swedish Tractor Development #2	4.313
60-R 42	Rubber-Wheeled, Steel-Track Crawlers-Swedish Devel. #1	4.313
60-R 43	Scaling Slabs & Edgings By Water Displacement	7.237
60-R 44	Debarking Of Thinnings In Norway	4.214
60-R 45	Swedish Pulpwood Truck-Trailer Equipment	4.314
60-R 46	A Method Of Chip Handling And Measuring	5.611
60-R 47	Rental Rates For Construction Equipment (Review)	4.011
60-R 48	Permanent Logging Roads For Better Management (Review)	6.331
60-R 49	Spaulding Pulp & Paper Co. Chip Unloading Pit	4.511
60-R 50	Handy Spray Tank Carriers	3.36
60-R 51	Portable Camp Sled	6.321

selected for coverage at each meeting of the Technical Committees reveals 1960 problems and areas of interest as follows:

Appalachian

May—Intensive Management of Company Lands

October—Trucking and Woodyard Handling of Long Pulpwood

Northeast

June—Industrial Forestry Practices—Symposium on Trucking

August—Joint Meeting—Woodlands Section, CP&PA: Application of Small Tractors For Logging; Application of Scandinavian Logging Methods To Eastern North America; Development of the Chip Program in the Northeast; and Mechnical Loading Methods

Southeast

April—Wood Supply and Improved Production Costs—Long-Length Pulpwood Vs. Shortwood Production

November—Long-Length Pulpwood Logging—Technical Review

Lake States

April—Motorcade Through The Appalachian Region, Visiting Member

APA TECHNICAL PAPERS—1960

Southwestern Technical Committee—May, 1960

60-P 1 The Need For Keeping Pulpwood Production Costs In Line
60-P 2 Meeting The Challenge Of Successful Pulpwood Production
60-P 3 Wood Inventories As Viewed By Management Of A Newsprint Mill
60-P 4 Wood Inventories As Viewed By Management Of A Hardwood Mill
60-P 5 Wood Inventories As They Affect Pulpwood Transportation
60-P 6 Factors Behind Last Fall's Wood Shortage In The Southeast
60-P 7 Wood Inventories As They Affect The Pulpwood Prod. Organization
60-P 8 Wood Inventories And Coordination Of Wood Flow To The Mill
60-P 9 Wood Inventories As Viewed By Wood Procurement In A Newsprint Mill

Southeastern Technical Committee—May, 1960

60-P 10 Report On Rubber-Track Tractors
60-P 11 The Forest Survey As Viewed By Southeastern Paper Companies
60-P 12 How Mills Can Help Improve The Forest Survey
60-P 13 Present Forestry Practices As They Affect Pulpwood Supply And Harvesting Efficiency
60-P 14 Outside Chip Storage—A Way To Increase Timber Supply And Reduce Production Costs
60-P 15 Hardwood Veneer Chips—Increasing Supply And Reducing Production Costs Through Utilization
60-P 16 Planer Chips—Increasing Timber Supply And Reducing Production Costs Through Utilization
60-P 17 How A Research Organization Functions
60-P 18 Long-Length Pulpwood Vs. Shortwood Production —N. C. Operations
60-P 19 Long-Length Pulpwood Vs. Shortwood Production —Fla. Operations
60-P 20 Long-Length Pulpwood Vs. Shortwood Production —Va. Operations

Western Technical Committee—November, 1960

60-P 21 P.F.I.'s Forest Management Program
60-P 22 Forest Inventory Methods—Western Operations
60-P 23 Forestry Research
60-P 24 A Method Of Estimating Defect In Grand Fir
60-P 25 Portable Woods Debarking And Chipping Economic Appraisal

Western Technical Committee—June, 1960

60-P 27 American Pulpwood Tour
60-P 28 Cordwood Volume By Weight
60-P 29 Chip Quality Control And Measurement
60-P 30 APA Policy And Action Pertinent Legislation

Appalachian Technical Committee—October, 1960

60-P 31 Let's Cut Pulpwood Long
60-P 32 Results Of Producer Survey And Mill Comments Relative To Receiving Wood Longer Than Five Feet
60-P 33 Our Experiences In Changing From 5-ft. Wood To 7½-ft. Wood At Big Island, Virginia
60-P 34 Experiences With Handling Long (7½') & Short (5') Length Pulpwood
60-P 35 Slashers
60-P 36 Woodyard Design For Longer Wood

Lake States Technical Committee—November, 1960

60-P 38 Progress In Michigan's Industrial Forest Land Use
60-P 39 Multiple Use Of Upper Peninsula Power Company Lands
60-P 40 Multiple Use On Cleveland Cliffs Iron Company Lands
60-P 41 Multiple Use—Detroit Division—Scott Paper Company
60-P 42 Multiple Use—Huss Ontonagon Pulp And Paper Company
60-P 43 Multiple Use—Lands of Escanaba Div. of The Mead Corp.
60-P 44 Multiple Use—Consumers Power Co.
60-P 45 Multiple Use—Abitibi Corporation
60-P 46 Multiple Use Concerning Cliffs Dow Chemical Company
60-P 47 Multiple Use Of The Celotex Corporation Forest Lands
60-P 48 Multiple Use—S. D. Warren Company—Central Mill
60-P 49 Progress in Kimberly-Clark of Mich. Inc.—Ind. Forest Land Use
60-P 50 The Public's Benefit From Multiple Use On C & H Lands
60-P 51 Multiple Use On The Lands Of Marathon—Division of American Can Co.
60-P 52 Expanding Uses Of Industrial Forest Land In Minnesota
60-P 53 Multiple Uses Of Company Forest Lands
60-P 54 Multiple Use—St. Regis Paper Company—Northern Division
60-P 55 Multiple Use Of The Northwest Paper Company Forest Lands
60-P 56 Industrial Forest Land Programs In Wisconsin
60-P 57 Multiple Use Of Combined Locks Paper Company Lands
60-P 58 Mulitple Use Of Industrial Forest Lands
60-P 59 Multiple Use On Ripco Industrial Forests
60-P 60 Multiple Use On Industrial Forest Lands
60-P 61 Multiple Uses Of Lands
60-P 62 Multiple Use On Owens-Illinois Industrial Forest
60-P 63 Land Use Programs
60-P 64 Multiple Uses On The Mosinee Industrial Forest
60-P 65 Multiple Use Opportunities On Public Lands
60-P 66 Multiple Use Opportunities On State Lands In Wisconsin
60-P 67 Multiple Use Opportunities On Public Lands In Michigan
60-P 68 Multiple Use Management Of National Forests In The Lake States
60-P 69 A Management Viewpoint Of Forest Land Uses
60-P 70 Bombardier Model RR-60 Tree Length Logger
60-P 71 Michigan Model 75 Pulpwood Logger
60-P 72 Volume Table Based On Basal Area Per Acre For Aspen

Southwestern Technical Committee—November, 1960

60-P 73 Outside Storage Of Chips At Louisiana Mill
60-P 74 Outside Chip Storage At Gulf States Paper Co. Corporation
60-P 75 Outside Chip Storage—Pneumatic Conveying Equipment
60-P 76 Outside Chip Storage—Automation Possibilities
60-P 77 Seven Months Outside Storage Of Pine And Hardwood Chips
60-P 78 Chip Cars In Arkansas And North Louisiana
60-P 79 Scaling Sawlogs By Weight
60-P 80 The Pulpwood Production Survey As Viewed By Marathon Sou. Corp.

Southeastern Technical Committee—November, 1960

60-P 81 Outside Chip Storage—Bowaters at Catawba, S. C., and Weyerhaeuser at Plymouth, N. C.
60-P 82 Pro And Con—Company Harvesting Crews On Company Lands
60-P 83 Pulpwood Production In Sweden, Norway and Germany

Companies–Their Wood Yards, Operations and Forestry and Pulpwood Logging Practices

November–Programs For Maximum Use of Forest Lands in the Lake States

Southwest

April–Factors Affecting Pulpwood Production–Adequate Pulpwood Inventories

November–Technical Review–Outside chip storage installations

Western

June–Sawmill Residual Chip Program–Scaling Pulpwood By Weight–Drum Barking and Chipping At A Sawmill–A Thinning Operation For Pulpwood–Chip Specification Survey Report

November–Selective Logging and Relogging For Pulpwood

An indexed list of the Technical Papers presented at the 1960 Regional Technical Committee Meetings is published on these pages.

In addition to the regional meetings, the various Technical Committees frequently participate in other activities for the mutual interest of members and for the benefit of the industry.

Safety and Training Program

The Safety and Training Program of the Association has been most active during the past year. We are continuing our efforts to make headway toward an improved safety record for our industry.

Several of the Regional Technical Committees are continuing the use of envelope Safety Flyers and Posters. The Lake States is now distributing their third annual series, the Southeast their first, and the Northeast has the matter under consideration.

In the Northeast, a third series of Safety Training Conferences is being held during the Spring of 1961. These conferences are aimed at the independent pulpwood producers and company personnel normally not included in the Technical Committee Meetings.

Basically, the Association and the entire pulpwood industry, along with other industries, is interested in promoting safety as a method of increasing production not just for safety's sake.

Statistics Program

Our statistical program both improved and broadened in coverage during 1960. Participation in our pulpwood reporting now consists of 193 mills, which represents about 95% of the total pulpwood consumption in the United States. The number of southern mills reporting statistics for our Weekly Pulpwood Summary have increased to 62.

The Second Supplement to the Pulpwood Statistical Review, published in May 1958, was published and distributed in November of 1960. The Second Supplement included a summary of our monthly (by states) and quarterly pulpwood reports for 1959.

Forest Management Program

In addition to consideration and recommendations on technical phases of legislation introduced in Congress with respect to the conservation, preservation and use of natural resources affecting public and private forest lands, the APA Forest Management Program was concerned with five items of primary interest: (1) "The Program for National Forests"; (2) work with the Forest Industries Council; (3) Small Woodland Ownership Programs; (4) Industry policy on forest recreation; and (5) Pulpwood Industry Facts booklet.

Program for National Forests

Following through on its previous actions with respect to the "Program for National Forests" presented by the Secretary of Agriculture to Congress in 1959, the staff conferred with the Forest Service seeking more recognition of pulpwood in forest survey releases and reports, more emphasis on pulpwood sales on National Forests and less comparison of 25% fund payments, road and fire control expenditures as justification for federal ownership. These are items of continuing interest and activity.

Forest Industries Council

Active interest and participation was continued in the meetings and activities of the Forest Industries Council. Support was accorded to the development of policy statements dealing with: (a) development of wilderness and forest recreation areas; (b) limitation of government forest land acquisition; (c) assistance in obtaining industry representatives on the Forest Research Advisory Committee of the Department of Agriculture; (d) recommendations of the FIC forest pest committee pertaining to the need for

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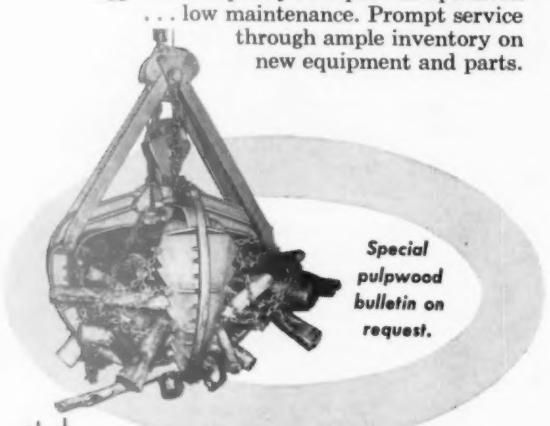
• Owen Pulpwood Grapples shorten the time between raw material and income-producing finished product. Reasons: *bigger* load capacity . . . speed of operation . . . low maintenance. Prompt service through ample inventory on new equipment and parts.



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studying the benefits of pest control programs and the losses caused by forest pests; and needs for a research program on animal damage to forest crops.

APA, through the Forest Industries Council, will provide some financial assistance to the National Academy of Sciences-National Research Council in their Committee to make an unbiased study of the nature and extent of possible hazards to wildlife through the use of insecticides.

Small Woodland Ownership Programs

Assistance was rendered to two Committees considering this problem during the year. The first, a subcommittee of the Forest Management Committee, had under consideration a tentative draft of "Industries Recommendations for Services to Small Woodland Owners", prepared during the preceding year. Their report indicated that more intensive work was required on this subject in order to coordinate such recommendation with other forest industries.

The second was a special committee, appointed by the Board of Directors, to analyze a proposed, very detailed program to solve small forest ownership problems which was presented by L. E. Barrett at a meeting of Consulting Foresters in October, 1960. This Committee's recommendations were presented and reviewed by the Forest Management Committee of the National Lumber Mfg. Assn., the APA Executive Committee and with some modifications were approved by the Forest Industries Council as representing the views of the three Associations making up the Council, namely, the American Paper & Pulp Association, American Pulpwood Association and the National Lumber Mfg. Association.

Forest Recreation

Recognizing the growing needs for forest recreation areas throughout the nation and their impact on forest lands, whether in government or private ownership, the APA Board of Directors authorized appointment of a special committee on Forest Recreation to attempt to develop a broad industry policy of recreation on all lands.

The staff prepared a confidential questionnaire on Forest Recreation, handled the distribution, and the summation of the replies on a national and regional basis. As a result, the following policy recommendation was prepared and approved at the 1961 Annual Meeting.

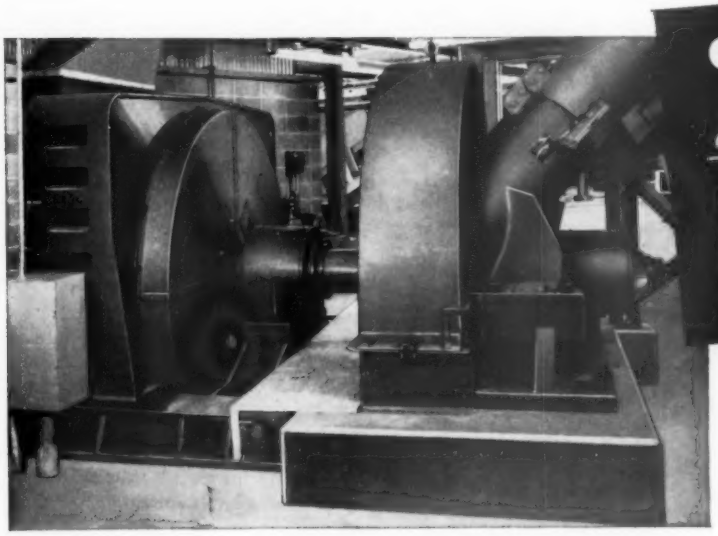
"The Forest Industries Forest Recreation Policy pertaining to public and/or privately owned forest lands should include the following points:

1. The industry favors recreational use of forest land under the multiple use concept. For wilderness areas the industry favors area limitations in keeping with sound economic and recreational needs of the total population.

2. The industry favors fees or charges for public use of special recreational facilities and services.

3. Either the owner/custodian of the land or the lessee, depending upon local circumstances, should be encouraged to provide for the construction, maintenance and operation of such recreational facilities as may be necessary to carry out the recreational objectives of the area concerned.

In recognition of our expanding population and increasing leisure time for recreational pursuits, the Committee recommends that APA and individual members recognize and take active part in programming and planning for recreational needs of the future, and each individual member work up a constructive program for development of its lands in cooperation with state, federal and local agencies consistent with the productive use of its lands for their primary purpose of wood production."



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Stabilize Logs in Spout for Uniform, Clean-Cut Chips

Carthage Standard Chipper Operating at
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Engineered and Erected by
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With at least two knives cutting at all times, the log is held steady in the spout. Consequently the chips are clean-cut and uniform in length. Log stability, resulting from close spacing of knives, is achieved by three important Carthage design features:

1 Number of knives.
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Extremely heavy construction combined with hard surfacing at points of wear result in long service life and low maintenance costs.

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Pulpwood Industry Facts

During the year the staff worked on preparation of an outline for publishing a revised edition of "Pulpwood Industry Facts," which was last published in 1956. In addition to the outline, most of the basic data for presentation in the booklet has been assembled. The Association plans to have this revised booklet published during the year through cooperation with the American Forest Products Industries, Inc.

Legislative Program

Labor Legislation

During the second session of the 86th Congress, major attention was centered on legislation to amend the Fair Labor Standards Act. APA was primarily concerned with efforts to retain the 12-man forestry and logging exemption and the seasonal exemption as it applied to logging. An intensive campaign was conducted, in cooperation with other national, regional and state forestry and industrial association, to retain those exemptions. The staff also appeared before the House Subcommittee on Labor Standards in support of the pulpwood industry's position. These efforts were successful in that both exemptions were retained in the House and Senate bills, which however, died in Conference Committee.

National Forests—Rights-of-Way

In the field of forestry legislation, there were innumerable bills introduced on many of which APA made its stand known as circumstances dictated. Of major concern, was a Department of Agriculture sponsored bill pertaining to rights-of-way and easements across national forest lands which would repeal traditional rights of ingress and egress. APA participated in several conferences of industry and Forest Service personnel attempting to work out a satisfactory approach to meeting Forest Service problems in this field yet protect industry interests. They were successful in resolving some differences and in determining that further conferences could bring about satisfactory results. APA appeared before the Senate Committee on Agriculture objecting to these sections of the Department's bill detrimental to the industry. Also prompt action was taken to offset an attempt to incorporate these same sections in a road authorization bill under consideration by the Senate Public Works Committee.

National Forests—Multiple Use

APA conferred with the Forest Service to secure a suitable revision of one section in the proposed National Forests-Multiple Use bill so as to emphasize the basic policy for establishment of the national forests. APA supported the bill with amendment of the section referred to before the House Committee on Agriculture.

National Forest Products Week

Support was given toward securing a favorable report from the House Judiciary Committee on a Senate Joint Resolution establishing an annual "National Forest Products Week", which was enacted into law.

Wilderness System

It was again necessary to combat efforts to create a National Wilderness Preservation System. APA urged the Chairman and members of the Senate Interior and Insular Affairs Committee to give serious consideration to the proposed O'Mahoney-Allott amendments with hearings on their proposals. Members and cooperating association were urged to contact the Committee members. The Wilderness bill died in Committee.

Industrial Use—Agricultural Products

A Senate-House Conference Committee was finally appointed to consider similar legislative proposals to create an Agricultural Research and Development Commission to provide for increased industrial use of agricultural products. APA informed the Conferees that the House bill was favored since it did not superimpose a new administrative agency over existing agencies; fund authorizations would be under budgetary controls; and the government would not be in competition with private industry in research, product development and manufacturing. The Conference Committee failed to reach agreement on a bill.

Projections of Pulpwood Requirements

In addition to legislation, two other items required careful consideration and attention.

One concerned the release of Committee Print No. 8 of the Senate Select Committee on National Water Resources. This report dealt with the "Future Water Requirements of Principal Water-Using Industries", which included the pulp and paper industry. It reported extremely high projections of pulpwood requirements for the year 2000. APA filed a statement and detailed analysis of the report emphasizing its concern with the accuracy and magnitude of the projections and the apparent tendency of Congressional Committees to use private agencies for analyses and statistical projections which government agencies are then directed to use in preparing reports to Congress. Since the basic data developed by private agencies is not generally available to the public, there is no way of checking their conclusions and projections.

SBA—Timber Set-Asides

The second concerned proposed rules changes of the Office of Small Business Size Standards of the Small Business Administration pertaining to timber set-asides of government owned timber for purchase by small businesses. The proposed rules change would have made ineligible small loggers financed to any extent during the preceding year by a forest products concern not classed as a small business. APA, several members, and cooperating associated filed objections and the proposed amendments were revised.

APA continued its policy of working closely with other more directly interested groups on numerous legislative items in which the pulpwood industry is interested but not as directly affected.

Smooth 18 ton hydraulic power splits big profits for you from the toughest woods, including American Elm. 7 HP trailer unit squats under own power to receive large logs without "dead" lift. Has 2 speeds, auto-shift and auto-stroke. 26" ram travel splits up to 34" lengths, any dia.—or, with extended frame and adjustable wedge, splits up to 52" lengths, any dia. Write for details.
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MURCO 102", 10-knife Pulpwood Chipper installed at East Texas Pulp and Paper Co., Evadale, Texas

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MURCO 90" Left-hand 10-knife Chipper installed at Rome Kraft Mill, Rome Georgia

MURCO 112" 10-knife right hand chipper complete with blower housing, disc brake and pneumatic spout cover lifting device. Two identical chippers installed at Bowaters Carolina Corp., Catawba, South Carolina

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MURCO Round Log Pulpwood Chippers are designed to include the most desirable features for today's production requirements . . . the result of long and careful study of the various features that contribute to outstanding chipper performance in producing more and better chips at less cost . . . less sawdust, fewer slivers, freedom from repairs yet at the same time having production records of 100 cords or more per hour. The MURCO heavy design construction reduces vibration.

All backed by years of constant development so that each year results in an improved chipper design, the latest of which is MURCO UNI-CHIP that produces more uniform chips with less bruising.

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WRITE for MURCO Chipper booklet. A complete and detailed story on pulpwood and wastewood chippers... specifications on each model ... yours upon request. Write for it today.

MURCO 104" 12-knife chipper with Uni-chip knife mounting, 24" "V"; spout, Blower housing - disc brake, spout cover lifting device. Motor synchronous 1250 H.P. 360 RPM. Motor coupled to chipper shaft with a flexible floating type coupling ... unique design in that the coupling connection is on the end of the shaft. Installed at Tennessee River Pulp & Paper Co., Counce, Tennessee.

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Here the tractor uses its Rome K/G Blade* to shear the undesirable hardwoods. A seeder at the rear of the machine drops seeds three to four feet apart in the cleared path behind the left track. As the D6 Tractor makes the next pass, the cut material falls over the seeded area protecting it from mice and rabbits and adding organic matter to the soil. Seed rows are spaced about six feet apart.

Peak production, all day long, is easy to come by with a D6B Tractor. Its 93 HP Cat Diesel Engine develops the highest torque rise in its class—provides extra push to take out heavy growth. Controls are convenient and easy to use. The seat is comfortable. These help the operator stay alert so that he's still working the machine hard and fast at the end of the shift.

And it's economical production, too. Such D6 features as the dry-type air cleaner, lifetime lubricated track rollers and the exclusive oil clutch trade service time for work time—keep operating costs to a minimum.

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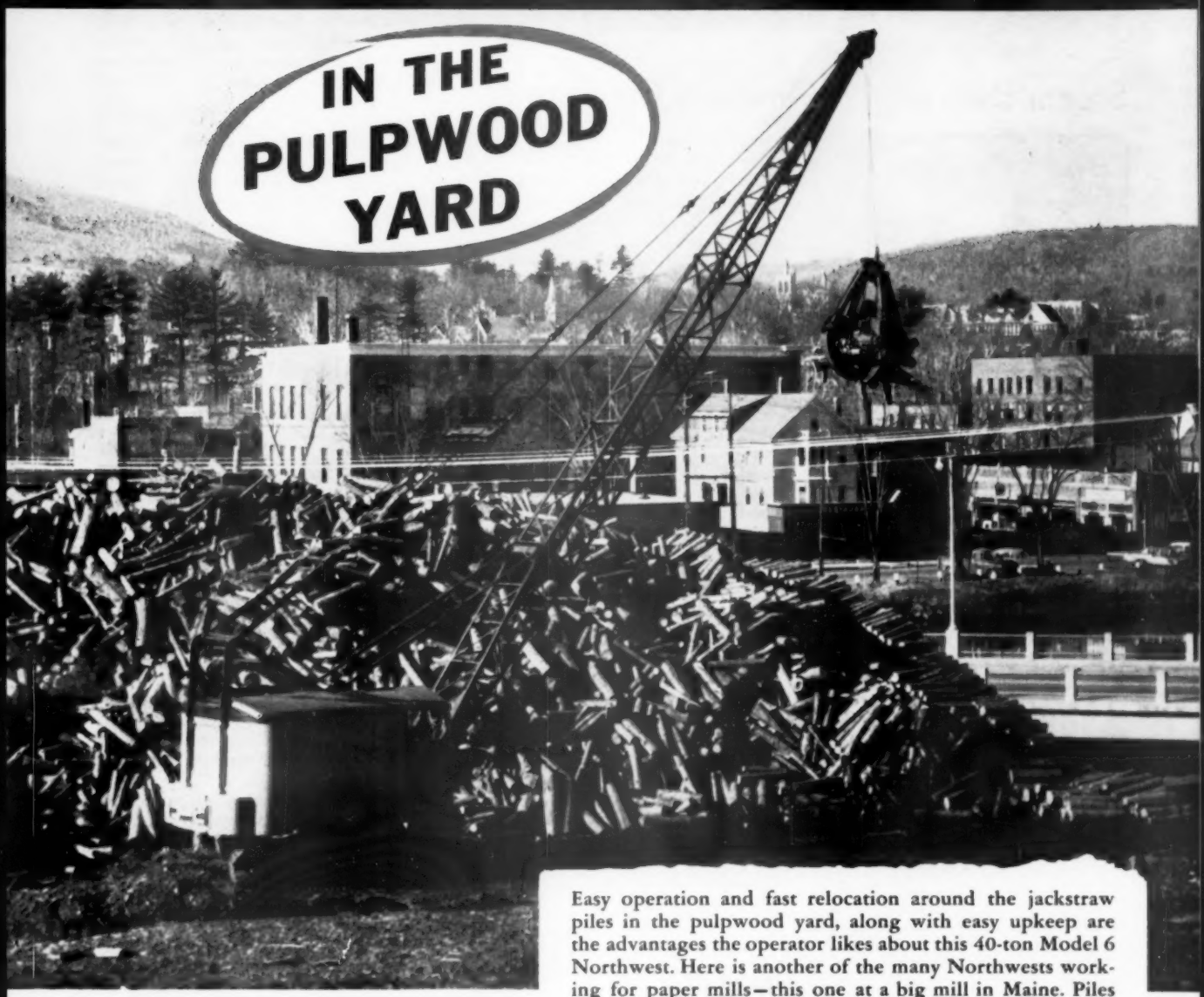

Easy operation and fast relocation around the jackstraw piles in the pulpwood yard, along with easy upkeep are the advantages the operator likes about this 40-ton Model 6 Northwest. Here is another of the many Northwests working for paper mills—this one at a big mill in Maine. Piles run up to 60 feet and loads come in bundles of 4,500 lbs.

Northwests fit into places like this. Tail swing is short. Machine steers with cab in any position. The Northwest Independent High-Speed Boom Hoist assures smooth booming for reaching trucks, cars or stack. It can work into a pile and load out or load in without lost time in turning, as with front end equipment, and you don't need a man on the stack.

A Crawler Crane will save space, time and money for the paper mill and a Northwest brings you a combination of advantages found in no other similar equipment. They have proved themselves in the pulpwood yards and in harvesting for some of the country's leading mills. If you are planning to add to your handling equipment, you should find out about the advances in design in Swing Clutches, in Boom Hoist equipment and in the extra capacity available in the Northwest line of Lifting Cranes. Details make equipment. Dig into them. Let a Northwest man tell you more about Northwest equipment in paper mill operation.

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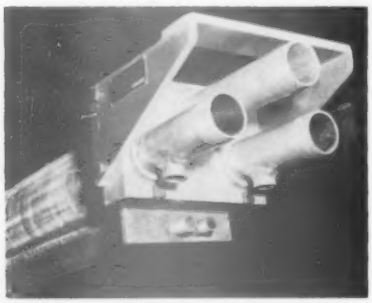
NEW EQUIPMENT

Steam shower gives uniform moisture



Applications: Developed for calender and supercalender paper finishing operations and other applications where upwardly directed drip-free steam used. Will increase finish, reduce curl, remove static, eliminate moisture variation across sheet and, if installed between bottom calender roll and reel, reduce finish, it's claimed.
Advantages: Multi-chamber units (2, 3 or 4 compartments) apply dripless steam either (1) uniformly across full width of web as a single component, or (2) the flow from each chamber can be regulated to compensate for moisture variation across web. Steam flow from each compartment is infinitely variable from zero to maximum. In finishing a web ranging from too dry at one edge to moist at the other, steam application is compensatingly controlled to yield across-web uniformity.
Specifications: Available either in aluminum or mild steel, the 2, 3 or 4-way control units are recommended for shower lengths of 100 in. or more. Steam feeds into Super-Unit showers from but a single end. Inlet pipes (3-way control unit in photo) are equipped with individual water extractors and drains; shell enclosing steam pipes equipped with trough drains—one per compartment. Condensation is trapped at sources and drains off automatically. Installation calls for mounting unit so precision-machined steam slot is at top "dead center" position. Entire assembly remains hot if steam applied to one or more chambers.
Supplier: **J. H. Dupasquier Dripless Steam Showers, 560 E. Clarendon Street, Gladstone, Oregon.**

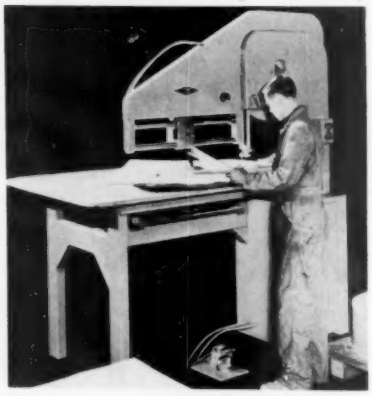
Ball valves

. . . fast, easy to operate

Applications: BL-300—rated at 300 lb. for water, oil or gas service at max. temperature of 250°F—is available in sizes from ½ to 2 in., inclusive.
Advantages: Unit is said to be a precision-built valve for general purpose service at a cost "no more than a high-quality standard bronze gate valve." Requires only quick quarter-turn of handle to open or close, compared to several full turns required to operate gate or globe valve. BL-300 has "automating" seats that assure positive sealing in either flow direction, making it ideal for vacuum service. Ball combines with seats for smooth positive operation. Wiping action of ball across seats forces out foreign matter and thus prevents abrasive wear. Buna "N" seats are impregnated with molybdenum disulfide to give slippery, non galling surface. "O" ring stem seals assure leak-proof stuffing box. Body, cap, stem, disc and ball are made of naval bronze for maximum strength and safety.
Supplier: **American Chain & Cable Co. Inc. (R-P&C Valve Div.), Reading, Pa.**

Head cutter

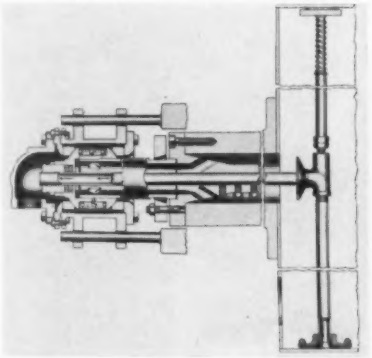
. . . obviates large inventory



Applications: To provide immediate availability of "right size" paper head.
Advantages: Operator can cut heads from stacks of up to 6-in. thickness in "a few seconds' time." Foot pedal control of upper pivot clamp leaves operator free to handle stock with both hands. Unit obviates need for maintaining large inventory of various size heads and frees space normally used for such storage.
Specifications: Machine consists of bandsaw and foot-controlled, air-operated pivot clamp. It will cut diameters of 6¾ in. and larger. Cutter requires 30 to 50 sq. ft. floor space, depending on model. Sixty-psi air supply is required. Various motor and equipment options offered.
Supplier: **Lamb-Grays Harbor Co. Inc., P.O. Box 359, Hoquiam, Wash., Tel: Hoquiam 1000.**

Rotary syphon

. . . improves condensated removal



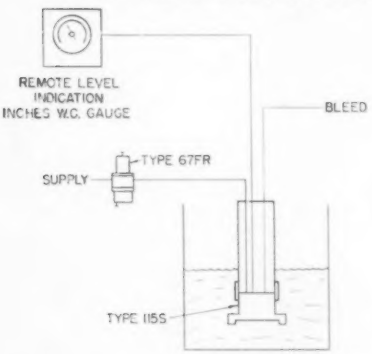
Application: Paper machine dryer roll condensate drainage.
Features: Rotary syphon uses new concept pickup design to evacuate condensate from dryer rolls more effectively. Film of condensate is held to a minimum, permits more efficient transfer of heat units from steam to dryer shell. Pickup fittings can be at any point along the sheet to keep temperatures more uniform along the face.

By eliminating weight of excess water inside roll, the Johnson rotary syphon reduces amount of horsepower required to turn the roll. Better condensate removal also cuts down on prolonged or unnecessary "cascading" and undue bearing wear.

Ease of installation is another feature. There is no need to get inside the roll; no internal drilling or tapping. Pickup fitting is inserted right through the manhole. For dryer rolls with handholes only, there is an alternate version which can be inserted through the journal.
Specifications: This new rotary syphon is engineered for installation with the Johnson rotary pressure joint. The rotary is concerned with getting steam into the roll and providing passage out for condensate. The rotary syphon takes over inside the drum, extracting

minimum drying effect out of the heat units contained in the steam.
Supplier: **Johnson Corp., 849 Wood Street, Three Rives, Mich.**

Liquid level indicator
. . . variation of older unit



Applications: For all types of liquids and especially suitable to heavy, viscous materials or slurries.
Advantages: Type 115S—a variation of Type 115—is said to be excellent for corrosive liquid applications, since all parts coming into contact with liquid are of stainless steel.
Specifications: Unit is designed to be mounted on 4-in. pipe and immersed into liquid. Supply, registration and bleed lines run out through mounting pipe. Type 115S can be used to measure, indicate or record on static head pressure ranges of from 2 in. W. C. to 65 psi.
Supplier: **Fisher Governor Co., P.O. Box 307, Marshalltown, Iowa.**

Centrifugal pumps
. . . maximum interchangeability

Application: For chemical processing, corrosive or abrasive, cold or hot, clear liquids or slurries.
Features: This new line of single stage centrifugal pumps provides a high degree of interchangeability of pumps and parts. Specific advantages: maximum dimensional interchangeability between all pumps with one overall length for all sizes—23 in.; one coupling fits all sizes—1¾ in.; one dimension end of suction to centerline of

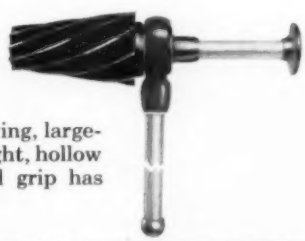
World's Fastest, Smoothest Hand Reaming

Self-Feeding
RIDGID®
No. 2-S
Spiral
Reamer

. . . reams pipe, conduit, sheet metal and wood!

Try a RIDGID Spiral Reamer, and you'll quickly feel how it reams its way into pipe, conduit, metal holes or wood without effort. Heat-treated cutting edges give maximum service life. Ratchet-action handle makes work easy in close quarters.

Now Available . . .
RIDGID No. 254 Spiral Reamer
for 2½" to 4" Pipe and Conduit



No more hand filing . . . here's the time-saving, large-size hand reamer you've always needed. Light, hollow construction makes handling easy. Hand grip has large butt plate for body pressure.

Call your Distributor today. For your convenience, he maintains a complete stock of RIDGID Work-Saver Pipe Tools and parts!

RIDGID
The Ridge Tool Company, Elyria, Ohio, U.S.A.

Satisfied with your process efficiency

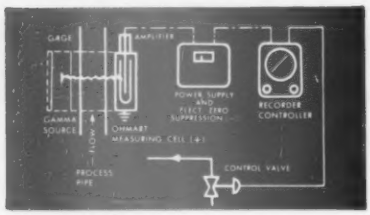
. . . if not, save with

ohmart

Nuclear Gages for Process Measurement and Control!

Obtain continuous, close limit control of:

- Green and black liquor density
- Percent solids of starch and clay slurries
- Percent solids of lime slurry
- Basis weight
- Level of chemicals, pulp, wood chips, in towers, tanks, bins, digesters, blow tanks



Typical Ohmart Density Control System where control of liquid density is by actuation of a valve. No part of the gage contacts the process material.

EXCLUSIVE OHMART ADVANTAGES: Ohmart gages have a precision and repeatability of ±2% of full scale or better, with ranges as narrow as 0.025 s.g.u. (4°Be., 5°Tw., 10°API, 5% solids) available. Ohmart systems operate with high signal-to-noise ratio; are unique in their stability and simplicity. Measuring cell has infinite life. Low-drift circuit requires only 5-minute semi-monthly standardization check. Rugged gage construction withstands severe atmospheric and mechanical conditions. Installation and maintenance costs are low. *Look to Ohmart to improve your process control. Performance to specification is guaranteed!* Write for literature.

THE OHMART CORPORATION
2242 Bogen St., Cincinnati 22, Ohio
Engineering Representatives in principal areas

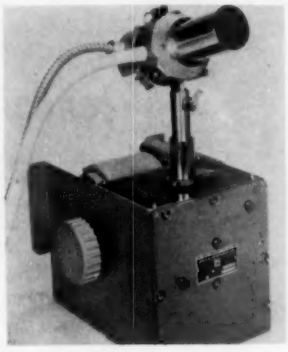
NEW EQUIPMENT . . .

discharge—4 in.; top centerline discharge is self-venting and simplifies piping; back-pull-out design enables easy replacement of parts most subject to wear or damage without disturbing pipe connections or motor mounting.
Specifications: Eleven sizes in the line provide capacities up to 775 gpm and heads up to 300 ft. All pumps in the group are of the top centerline discharge, back-pull-out design which results in the following advantages: mechanical reliability—insures dependable performance; maximum interchangeability between pumping units—simplifies process designers layout work; maximum interchangeability between pump parts—lowers spare parts inventory; and simplified application, installation and maintenance—lowers cost all along the lines, says the maker.

Complete line of 11 pumps is stocked in three standard constructions: ductile iron, 316 ss and Gould-A-Loy 20.
Supplier: **Goulds Pumps, Inc., 220 Black Brook Rd., Seneca Falls, N.Y.**

"Pivoting" pyrometer

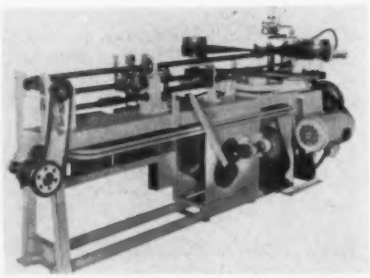
. . . detects hot spots



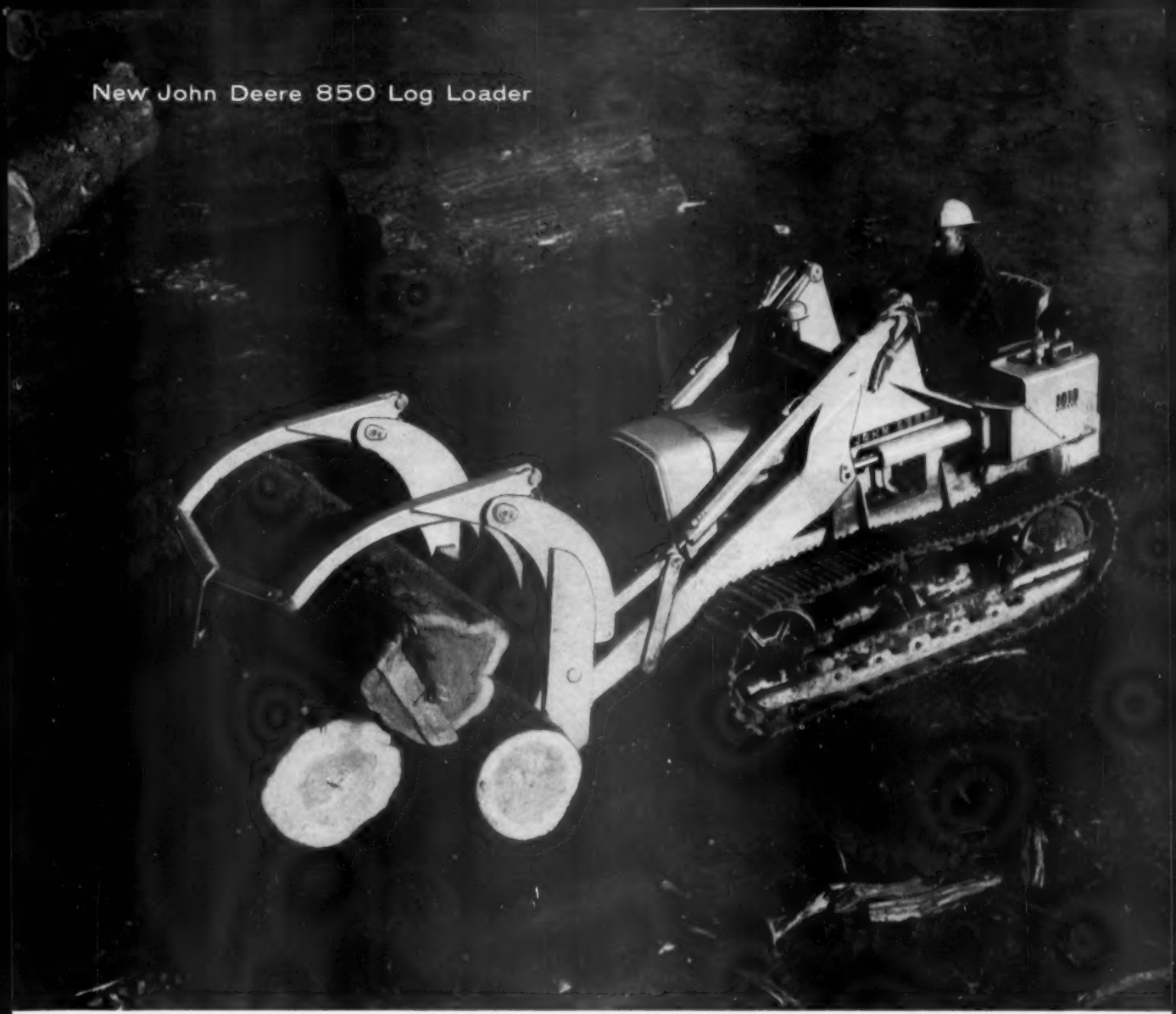
Application: For detecting hot spots on rotary kilns.
Features: Easily-installed "pivoting" pyrometer continuously scans and records temperatures on shell of rotary lime kilns. Unit automatically signals an alarm before any potential hot spot reaches the dangerous stage. It points out the location, and shows rate of change of the hot spot temperature. This prompt warning permits operator to take corrective action without having to shut down production.
Specifications: Scanning unit has a highly sensitive Rayotube (heat radiation) pyrometer combined with a drive unit. Advanced by the drive unit, the tube pivots through an 85° arc as it senses temperatures along surface of constantly-revolving kiln. Conveniently bolted to any nearby surface, beneath, beside or above the kiln, the scanning unit does not require specially built traversing mechanism or structural support.
Supplier: **Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia 44, Pa.**

Mechanical corer

. . . has high capacity



Applications: For making lightweight cores for rewinders producing toilet rolls, towel rolls, wax paper rolls, etc.
Advantages: Machine produces full length cores up to 90 in. long for automatic rewinding equipment, operating at speeds of 180 to 200 lineal feet of finished core per minute. Designed for winding two-ply cores using stock approximately 3 in. wide, this same design can be used to produce cores or tubes ranging from 1¼ in. i.d. to approximately 3 in. i.d. A small one-color flexigraph press is used for core identification. Newly designed winding head is mounted in anti-friction bearings and driven by timing belts.
Specifications: Core machine has two webs. One is carried through the printer and then on through the glue pan and into the core machine. The other web is carried directly from the unwind stand to the core winding mandrel where it is combined with the first web which already has the adhesive on it. Webs meet at the winding belt on the machine where they are spirally wound and then travel down the length of the core forming mandrel. The core then travels on to the cut-off section of the machine which consists of a pair of score type slitters cutting against a hardened section in the end mandrel section. This end mandrel section is driven so that the core is rotating while it is being cut, and at the same time the carriage is traveling along at the same speed that the core is being formed, insuring a good, smooth cut. Timing of the cut-off carriage is mechanically controlled by a cam located in the lower portion of the machine.
Supplier: **Paper Converting Machine Co., Green Bay, Wisconsin. Tel: HEmlock 7-7601.**



Now-a low-cost loader for yard and landing!

Designed for efficient handling of either sawlogs or pulpwood, the new 850 Log Loader extends John Deere "1010" Crawler economy to loading work at the deck, yard, and mill.

The 850 has a full-height lift capacity of 3280 pounds; breakaway of 6000 pounds. Forks are furnished on 29- or 48-inch centers as required. Lift height to hinge-pin, ten feet.

Loader maneuverability is greatly increased by the hydraulically operated direction reverser with wet clutch. Wet clutch packs make periodic adjustment and lubrication unnecessary.

Operator convenience is afforded by single-lever control of fork and lift arms; top clamp is separately controlled. Standard loader bucket or 805 Blade may be easily substituted for the log loader by means of pin connections. Rear-mounted winch completes the package.

For detailed specifications, plus facts on the John Deere Credit Plan, contact your dealer through the yellow pages now. John Deere, 3300 River Drive, Moline, Illinois.

JOHN DEERE

TRACTORS

BULLDOZERS

AND

LOGGING

EQUIPMENT

Lodding Supplier of New Table Roll Replacement

The new Lodding Adjustable Hydrafoil, engineered as a replacement for table rolls on paper machines, is manufactured by Lodding Engineering Corp., Auburn, Mass., under license from Dominion Engineering Works (U.S. Patent No. 2928465) for use within the continental limits of the U.S. and Canada. A report in the "New Equipment" section of our Apr. 3 issue, erroneously stated that Dominion Engineering was supplier in this area of these new wire doctor blades, designed to eliminate ridges generally associated with table rolls.

There must be a better way we can overcome these felt stretching problems!

FOR SIZE STABILITY... **ORR FELTS**

Long lasting Orr felts, the kind that keep downtime to a minimum, are tops in size stability for two reasons. First—carefully controlled manufacturing assures you of highest quality. Second, Orr felts are engineered to your requirements... they are made to do the job just for you! Ask for details.

ORR FELT & BLANKET CO.

PIQUA, OHIO

LETTERS to the editor

Newsprint Producer Sees Chance for Scudder Plan

EDITOR: I have read with interest your writeup dealing with the Scudder plan to produce newsprint from de-inked overissue newsprint (page 3, Feb. 20 issue, PULP & PAPER).

There is no doubt that a satisfactory sheet of newsprint can be made by de-inking old or overprint news. The size of such an installation will depend on the supply, and I would suspect that this process will be limited to relatively small units near large centers. These are the same areas, however, where quality is most important and the best in advertising reproduction and reader appeal is required to compete with other newspapers.

It has usually been found necessary to incorporate substantial amounts of long fibers, whether new pulps or waste papers, as colored ledger, bleached clippings, et cetera. Substantial amounts of mechanical and chemical treatment are required, material and heat losses are high. Stream pollution presents a serious problem.

When all of the above factors are considered, I would say that small units operating in large cities with no supply problems, and a short delivery haul, perhaps one day might be competitors with newsprint from virgin furnish.—*Newsprint company vice president (name withheld by request)*

The "New" PULP & PAPER: Easier Reading—More Concise

—New York

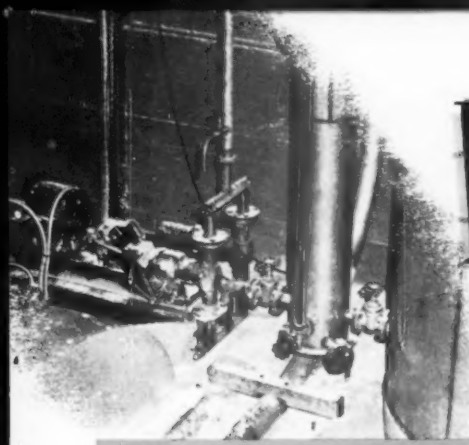
Editor: I think the new format of PULP & PAPER is great. It is a decided improvement over the old. It is typographically attractive, easier to read, easier to handle and its contents are informative and useful. Truly 'big league' stuff in the field of trade publications.—*Armand Rotonda, District Manager, American Forest Products Industries Inc.*

—New York

Editor: Congratulations on the new "look" of PULP & PAPER. It should make PULP & PAPER more attractive and more interesting and informative.—*Claude A. Raby, Industrial Products Dept., J. M. Huber Corp.*

Mobile, Ala.

Editor: The more I handle the new PULP & PAPER, the more I like it. I like the change and I expect you will find a high majority of similar comments.—*George E. Fromm, Industrial Chemicals Division, American Cyanamid Co.*



BECCO ECHO

PUBLISHED BY BECCO CHEMICAL DIVISION Food Machinery and Chemical Corporation, New York 17, N.Y.

Paper prefers Peroxide...

PAPER MAKERS are constantly seeking new and better ways to make paper whiter, brighter and stronger. And Becco Hydrogen Peroxide is helping spur progress in papermaking. Here's how we worked with three major pulp manufacturers to increase mill efficiency, improve paper quality, *and* cut costs—through new systems using Becco Hydrogen Peroxide:

A modern cold soda pulping facility is operated by Packaging Corporation of America. In its Filer City, Michigan plant, bleaching of the caustic-impregnated pulp is done in disk refiners using Becco Hydrogen Peroxide. This process provides an economical method of treating hardwoods which would otherwise be too dark for use.

Or consider Continental Can Company's latest project . . . a 350-ton capacity pulp and paperboard mill in Augusta, Georgia. It incorporates Becco's Refiner Bleaching Process in which the cold soda pulp is bleached by metering Becco Hydrogen Peroxide to the chips as they enter the refiners. The pulp brightness is increased about 20 GE points.

At the Keyes Fibre Company, Shawmut mill, Becco engineers spent several years developing the advantages and cost savings possible through installation of a new simple single-stage high density Hydrogen Peroxide bleaching system. Adaptability of high consistency bleaching to Keyes' "crumb" method of handling pulp was one of the deciding factors in its selection. Result: Savings on equipment and greater output per unit of space.

Can your pulp use a little assistance from Hydrogen Peroxide? Becco will be glad to provide you with technical data through a survey and estimate of your needs. Write to us at Dept. PP-61-9.

No Fish Story Here!

MEN are natural exaggerators when they describe the results of their fishing trips. Let them catch a minnow, and they bring home a whale! Becco, on the other hand, bends over backwards to assure *accuracy* in the delivery of specified quantities of hydrogen peroxide to its customers.

Thoroughly cleaned and carefully inspected aluminum drums are placed singly on Howe or Toledo scales; the reading is set at zero. The drums are filled with filtered hydrogen peroxide until the scale shows the labelled shipping weight. Carboys are handled similarly. These scales are inspected monthly by representatives of the scale company to maintain accuracy.

At our Buffalo plant, a Howe Track Scale and Type Registering Weighbeam is used for weighing tank cars and tank trucks. In the case of a tank car, the vehicle is placed on the scale, weighed, and a record is made of the tare weight. Filtered hydrogen peroxide is pumped into the car until it is filled to the base of the dome. It is then inspected, since the load, if not filled to the exact height, can cause the car to oscillate dangerously when it is in motion. The car is sealed and weighed. The difference between the two readings is the weight of hydrogen peroxide in the tank car. Finally, Becco's accounting department and the railroad receive copies of the printed records. The scales used are inspected and tested four times a year, and no inaccuracies have ever been reported.

The weighing of tank trucks is handled with similar care to ensure accurate delivery, and a weight certificate is furnished to each customer.

So, the fishermen have their stories, and we have ours—and ne'er the twain shall meet!

MORE than a third of a century of experience shows! Ever since it was founded 36 years ago, Becco has devoted its time and energy to the manufacture of hydrogen peroxide and to research in its application. Today, Becco provides industry with 10 additional peroxygen chemicals based on electrolytically-produced hydrogen peroxide.

Becco serves many industries—textile, paper, plasticizers, cosmetics, metal finishing, and is even doing its share in the fields of missile guidance and propulsion. The broadened use of peroxygen chemicals owes much of its present state to Becco's Research and Development staff which continuously studies customers' needs in an effort to keep pace with today's—and tomorrow's—world.

The technical "know-how" of our chemists, engineers, and technical fieldmen is available to you. Their experience has been condensed in a series of technical bulletins. A few are listed at right. If you find any of interest, just drop us a line on your letterhead and ask for the ones you want by number. We'll be happy to oblige.

AVAILABLE TECHNICAL BULLETINS

Product Descriptions

1. ACTIVE OXYGEN CHEMICALS
2. HYDROGEN PEROXIDE
3. HIGHLY CONCENTRATED H_2O_2
4. PERACETIC ACID 40%
6. SODIUM CARBONATE PEROXIDE
7. ALKALINE EARTH METAL PEROXIDES
8. SODIUM PYROPHOSPHATE PEROXIDE
10. UREA PEROXIDE
11. POTASSIUM PERSULFATE
41. BECCO H_2O_2 35% HP
42. BECCO H_2O_2 35% FORMULA D
45. SODIUM PERBORATE
46. CONCENTRATED H_2O_2
49. AMMONIUM PERSULFATE
70. BECCO HYDROGEN PEROXIDE 98%

Properties, Reactions, etc.

24. ANALYSIS OF ALIPHATIC PERACIDS
34. USES OF PERSULFATES A BIBLIOGRAPHY—PART I
40. EQUIPMENT FOR USE WITH HIGH-STRENGTH HYDROGEN PEROXIDE
55. STABILITY OF PURE HYDROGEN PEROXIDE
59. THE ANALYSIS OF H_2O_2 SOLUTIONS
62. HYDROGEN PEROXIDE VAPOR
68. USES OF PERSULFATES A BIBLIOGRAPHY—PART II
87. THE BEHAVIOR OF THE GLASS ELECTRODE IN HYDROGEN PEROXIDE SOLUTIONS
93. ANHYDROUS HYDROGEN PEROXIDE AS A PROPELLANT

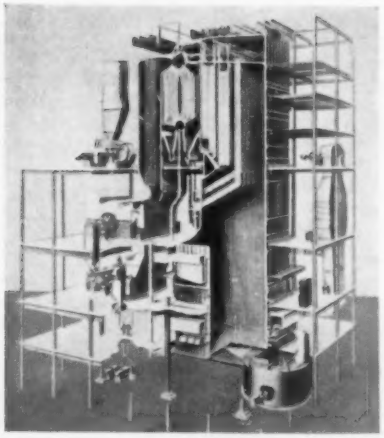
fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

BECCO Hydrogen Peroxide

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Becco Chemical Division

General Sales Offices:
161 EAST 42nd STREET, NEW YORK 17, N. Y.



Typical 2-drum C-E Recovery Unit for capacities exceeding 400 tons.

Reminder of...

FOUR FAMOUS FEATURES OF C-E RECOVERY UNITS

C-E Chemical Recovery Units are available in capacities presently running as high as 800 tons. Their high efficiency and availability are largely due to these exclusive C-E features:

1. **TANGENT-TUBE SUPERHEATER** – Tangent-tube panel construction sheds slag in a self-cleaning action. Slag falls to furnace floor directly beneath screen and superheater. Gas flows freely, at low velocities.
2. **CASCADE EVAPORATOR** *(coupled with electrostatic precipitator)* – Mechanically simple – requires a minimum of power and maintenance. Reliable, automatic controls maintain furnace stability over a wide range of liquor densities.
3. **WATERCOOLED DECANTING HEARTH** – Cooling causes a chilled layer of slag to form, protecting floor refractories from erosion. Hearth maintenance is eliminated! Molten slag decants through spouts placed several inches above the level floor.
4. **TANGENTIAL SECONDARY AIR** – Tangent air jets give gas mixture a turbulent, spiralling motion. Longer travel in furnace results. Combustion is rapid and complete, with reduced unburned char leaving furnace zone.

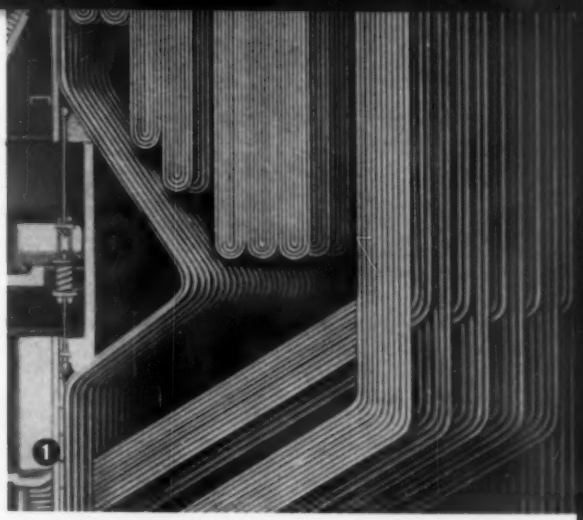
A 40-page catalog on C-E recovery units, bark burners and other boilers for the pulp and paper industry – as well as the answers to any of your specific questions – are available through the Paper Mill Division in Windsor or the C-E office nearest you. Inquiries are welcome.

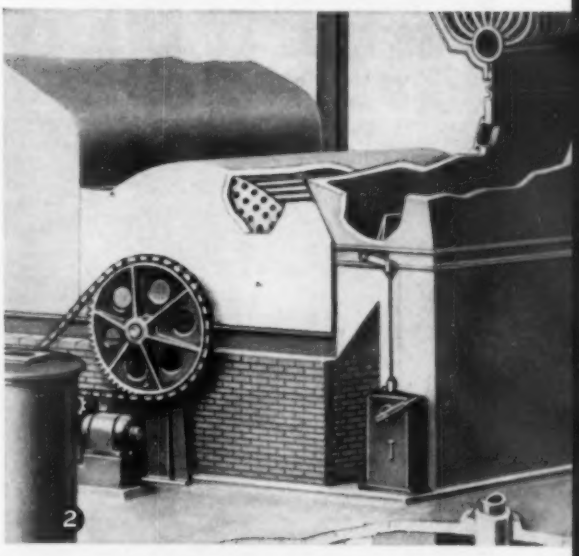
C-312

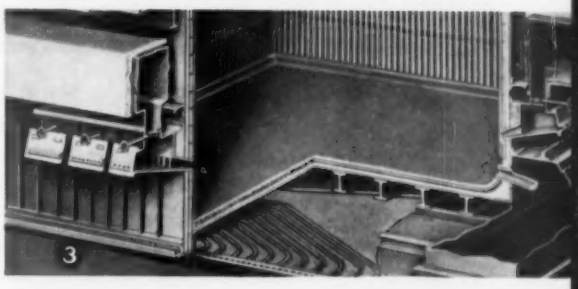
COMBUSTION ENGINEERING

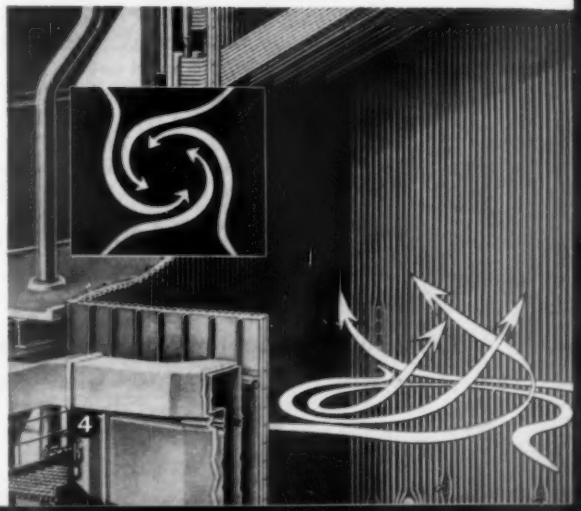
General Offices: Windsor, Conn.
New York Offices: 200 Madison Avenue, New York 16, N. Y.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE









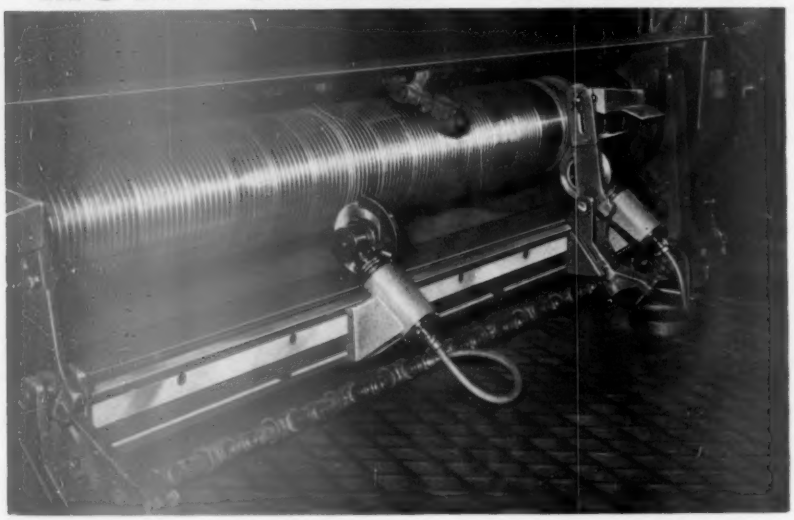
STRICTLY PERSONAL . . .

Starts on p. 33 . . . is the new firm. Perry and his son, Michael, will soon be joined by another son, **Kenneth**, who graduates from Columbia in June. Perry is former executive vice pres. and director of Castle & Overton and Michael, a graduate of Lehigh, was a Castle & Overton salesman. Perry's father, the late **Abner Koplik**, started in the paper stock business in 1895 and Perry entered the paper trade in 1934.

Albert H. Miller has been elected president and chief executive officer of John A. Manning Paper Co., Inc., Troy, N.Y., according to an announcement by **James F. Adams**, chairman of the board. Mr. Miller was formerly president of Lewis-Brownville Sales, Inc. (an affiliate of J. P. Lewis Co.) and before that was with Kimberly-Clark, Neenah, Wis.

Paul B. Carroll is now asst. general solicitor, International Paper Co. . . . **James W. Flatley** has been named asst. treasurer of IP, replacing **Arthur R. Storm**, who has retired. . . . **Scott B. Weldon** has joined Great Northern Paper Co.'s Millinocket, Maine staff as asst. production supt. He's a m.e. grad of the U. of Maine and has been with Scott Paper Co. for 9 years. . . .

JAGENBERG
"MULTI-SHEAR" SLITTERS



"MULTI-SHEAR" Slitting Unit in a popular score-cut winder

- READILY INSTALLED IN MANY SCORE-CUT WINDERS
- SUITABLE FOR NEARLY ALL GRADES OF PAPER AND BOARD
- PROVEN IN HUNDREDS OF WINDERS

Many types of score-cut winders can be converted to shear cut without extensive rebuilding by installation of a JAGENBERG "MULTI-SHEAR" slitting unit. Operators appreciate the greatly reduced set-up time of JAGENBERG "MULTI-SHEAR" slitters as compared with conventional shear cut systems.

When changing a winder from score cut to shear cut we replace the platen roll with a patented air-clamp slitter shaft. This shaft carries a large number of glass-hard steel bushings each of which has eight cut grooves to serve as bottom slitters. No tools are required to position the cut where it is needed. The run of the paper web is the same as for score cut.

Manual or pneumatic top slitters for the "MULTI-SHEAR" system are mounted on existing top slitter bars.

For full details of the "MULTI-SHEAR" slitting system contact

JAGENBERG USA, INC., 300 Park Avenue South, New York 10, N. Y.

In Canada: **JAGENBERG OF CANADA LTD.,** 209 Davenport Rd., Toronto 5, Ont., Canada

Walter E. Spearing has been promoted to plant manager, The D. M. Bare, Paper Co. Roaring Spring, Pa. He joined Combined Locks Paper Co., of which Bare is a subsidiary, in 1949.

Earle E. "Bud" Sproul has joined Northeastern Paper Sales, Inc., in pulp sales in the Midwest and Middle Atlantic States. He was previously with Riordon Sales Corp., Ltd.

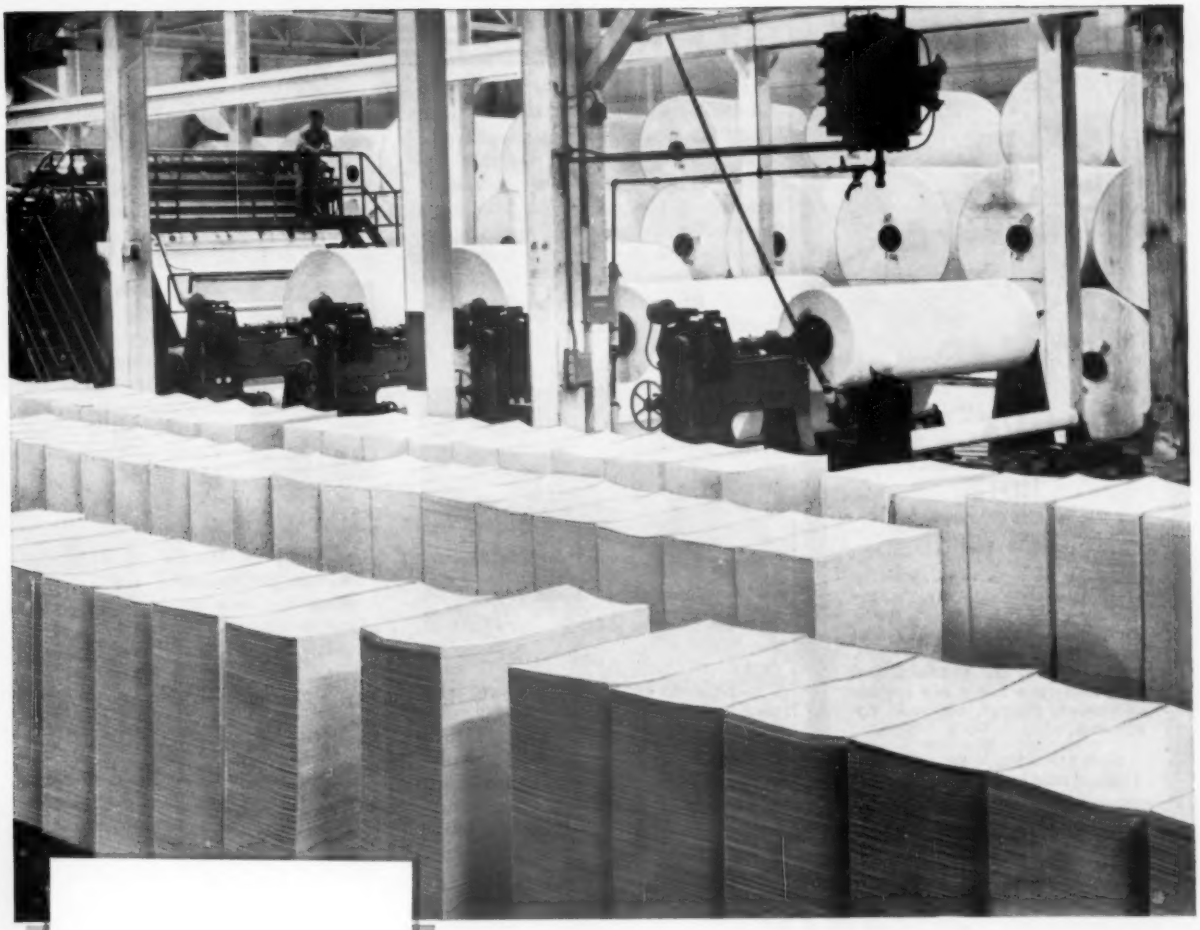
Gordon C. Inskeep, St. Regis Paper Co., New York City, is the new 1961-62 chairman of Metropolitan District TAPPI. Vice chairman and chairman-elect is **Alfred M. Hartley, Jr.,** Nopco Chemical Co., Newark; new secretary is **Con Carrano** of Jas. Carrano & Sons; and treasurer is **Milton D. Schreiber,** Keuffel & Esser. **Tom S. McConnell** of Air Reduction Co. was elected member-at-large.

Delano L. Boutin, sales engineer for Rice Barton Corp. of Worcester, Mass., has been assigned to the Savannah, Ga., sales office. He has been a member of the Worcester sales office for four years.

Robert Sloan is mgr., felt operations, Albany Felt Co. He is responsible for St. Stephen, S.C. and Hoosick Falls, N.Y. operations. He is also plant mgr. at Albany, N.Y.

Midwest

Clarence F. Klein has joined Packaging Corp. of America in the new post of director of machinery design and development. **J. L. Wilson,** vice pres. research



THIS IS GEORGIANIER

A bleached Kraft from southern pine, its high tear qualifies it admirably for quality paper products. Typical data on a Valley Test Beater at 30 minutes: Canadian Standard Freeness 530; Mullen Factor 116; Tear Factor 2.86; Fold Factor 12; Opacity 68.3%, G. E. Brightness 87.5%.

Write or telephone for your free samples and complete data.

product

Even though Rayonier produces the world's most complete line of pulps and constantly strives to anticipate your market requirements, there's no complacency at Rayonier about product superiority.

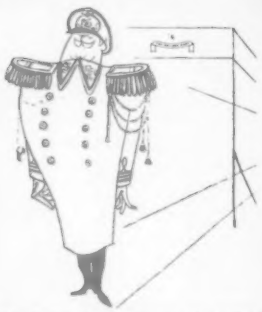
Instead we work to strengthen your competitive position with pulps of increasing qualities of strength, opacity, brightness and formation. For we have a long-term commitment with the paper industry: to supply you with the truly great pulps at realistic prices—like Georgianier, another rewarding opportunity for the papermaker.

For product excellence, start with excellence — a great Rayonier pulp!

RAYONIER
GREAT PAPER-MAKING PULPS

Rayonier Incorporated
161 East 42nd Street
New York 17, New York

World's Most Complete Line of Paper-Making Pulps: *Western hemlock bleached sulfites; western softwood bleached sulfates; western red cedar bleached sulfates; southern pine bleached sulfates; southern hardwood bleached sulfates; southern pine bleached sulfites.*



INTRODUCING THE NEW

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NEW YORK

Salon-size rooms • Terraces • New appointments, newly decorated • New 21" color TV • FM radio • New controlled air conditioning • New extension phones in bathroom • New private cocktail bar • Choice East Side, midtown area • A new concept of service. Prompt, pleasant, unobtrusive.

Single $15 to $22 Suites to $60
Special rates by the month or lease

Robert Sarason, General Manager

ORegon 9-3900
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STRICTLY PERSONAL . . .

and development, reported that Mr. Klein brings into the company's research and development program an increased emphasis on developing new systems of automation in packaging. Mr. Klein formerly was director of package engineering and development with Lord Baltimore Press, New York, an IP subsidiary. His office will be located in Grand Rapids, Mich.

Driessen West Dressler

R. E. Driessen and **P. H. West** have been named production managers of Mills No. 1 and 2 of Thilmany Pulp & Paper. **Fred Herbolzheimer Jr.** continues in overall charge of production. **R. C. Dressler,** div. mgr. in the paper mill, was promoted to pulp mill supt., succeeding Mr. West. **George Paschen** succeeds Mr. Dressler as mgr. of paper mill div. B-2.

Mr. West has been pulp mill supt. since 1941 and with Thilmany since 1938. Mr. Driessen joined Thilmany in 1937 and, after wartime duty with the Seabees, returned as engineering asst. to mfg. v.p.

Dr. John R. Fanselow, new acting head, paper technology dept., Western Michigan University. His appointment was announced in Apr. 3 issue. He was with Kimberly-Clark from 1930 to 1957.

Russell E. Vannatta, plant mgr. of Mead's Cincinnati Div. for past 8 years, has been promoted to div. mgr. He joined Mead in 1946, became plant engr. in 1947 and plant mgr. in 1953.

William E. Buchanan Jr., has been named southern sales representative of Appleton Wire Works, enabling the Appleton, Wis., company to better serve the South. He is in Montgomery, Ala.

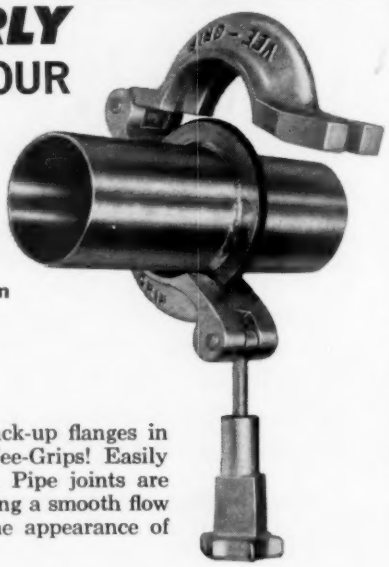
Donald L. Winter has been named tech. asst. in the Corn Div. of A. E. Staley, as assistant to **Thomas C. Garren,** Staley sales service supervisor. Mr. Winter first worked for Staley's between school semesters. After earning b.a. and m.s. degrees in chemistry from Millikin and Indiana universities, he rejoined Staley's as an associate research chemist.

South

PULP & PAPER tips its hat to **Tom Walbridge,** energetic and inventive woodlands engineer for Bowaters Southern Paper Corp. at Calhoun, Tenn. Tom has climaxed a 10-year-tenure of work on his ph.d. thesis. He received his doctorate of philosophy in Forestry from the University of Michigan during its winter commencement. His thesis, "Design of Harvesting Systems and Machines for Use in Pulpwood Stands of the Tennessee Valley as Directed by Intensive Forest Management" is considered a classic appraisal of pulpwood machinery in use in the South.

Southern Division . . . turn to p. 112

INSTALL *OVERLY* VEE-GRIPS IN YOUR STOCK LINES



- **A tight seal in seconds.**
- **Pipe is held in perfect alignment.**
- **Weigh less and cost no more than ordinary back-up flanges.**
- **Available for 3", 4", 6", 8" and 10" tube and pipe.**

Save time! Replace ordinary back-up flanges in your stock lines with Overly Vee-Grips! Easily put on or taken off in seconds. Pipe joints are held in perfect alignment, assuring a smooth flow of stock. They also improve the appearance of your stock line installations.

Write for catalog and prices

Serving the paper industry in custom metal fabrication of engineered air systems — machine hoods — Gardner Dryers—Westinghouse Sturdevant fans and steam coils — stock pipe — distributor rolls — suction boxes — white-water pans — head boxes — tanks.

OVERLY'S INCORPORATED

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FINISHED PRODUCT PROCESSING EQUIPMENT Winders • Reclaim Winders • Cutters • Sheeters • Slitters • Supercalenders • Roll Wrappers • Roll Lowering Tables • Roll and Shaft Handling Equipment • Conveyors • Unwind Stands and Tru-Tension Controls • and other equipment for the paper and allied industries.

before you decide on a new **winder**

meet some "Beloit Eastern" people

W. D. MARKOWSKI *(left and below)* is known to mills in the U. S. and around the world—Europe, Canada, South America—wherever modern plants set new production records. As manager of winder sales for Beloit Eastern Corporation, "Mark" brings to the problems of papermaking a vast knowledge of paper grades and a sure sense of practicality in winder applications.

GERRY FORSBERG *(right)* brings to the winder field a broad electrical industry background. He is representative of Beloit Eastern's ability to recommend and build high-speed winders to meet the most exacting mill requirements.

NEW FEATURES, complete range of sizes, styles, expert service make Beloit Eastern logical choice for modern winders.

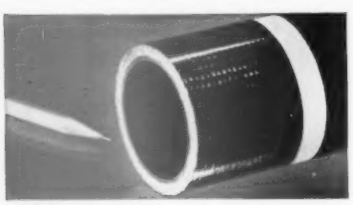
BELOIT EASTERN CORPORATION
Downingtown, Pennsylvania

Member Beloit Group

TEST PROVES CORROSION RESISTANCE . . . Stainless Steel 316 pipe (at left) and Fibercast Pipe were tested in 54% P_2O_5 solution at 290° F using modified ASTM A-262-55T formula. The stainless steel pipe showed .778" penetration per month; yet the Fibercast showed no deterioration whatsoever.

New pipes eliminate corrosion problems in processing industries!

- *handles a temperature range from −65° to 300° F.*
- *withstands an operating pressure range up to 1200 psi.*
- *pipe sizes from 2" to 8"*



WHAT is Fibercast?

It is centrifugally cast, thermoset, epoxy resin reinforced pipe that handles temperature and pressure problems where no other pipe will do. Its body of woven glass fibers resists high tension forces, is embedded and bonded by heat in epoxy resin. Result: strong, long-lasting pipe that resists high pressures and temperatures in corrosive environments.

WHEN should Fibercast be used?

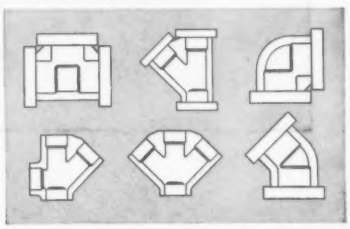
Whenever ease of handling, light weight, dielectric properties and structural stability are desirable in a piping material that is at the same time outstandingly resistant to heat, pressure and particularly corrosion.

Examples: Petroleum industry . . . chemical . . . petro-chemical . . . nuclear energy . . . textile . . . paper . . . food-processing . . . and countless other operations handling acids, alkalies, salt water and other corrosive liquids under pressure.

WHY use Fibercast?

Fibercast's remarkable lasting qualities . . . its amazing resistance to "impossible" temperature and pressure conditions . . . make it a long-lived, cost-saving, maintenance-saving pipe. Remember, too: Fibercast has the world's most complete stock of standard fittings, as well as couplings designed and made to order for individual requirements.

Workman is shown with section of Fibercast pipe bearing 32% HCl at a Shell chemical plant. Note that Fibercast has sufficient strength for installation on span racks with the spacing normally used for metal pipe.



Find out now how Fibercast pipe can save you money. Send the coupon below for complete information.

FIBERCAST COMPANY
Box 727, Sand Springs, Okla.

Please send me further information about Fibercast Tube and Pipe.

PP-51

Name _____

Title _____

Firm _____

Type of Business _____

Address _____

City _____ Zone _____ State _____

FIBERCAST® COMPANY

A DIVISION OF Youngstown SHEET AND TUBE COMPANY

on more and more paper machines — it's

SURFACE-WIND REELS by...

available with CENTER WIND ATTACHMENT

VALLEY IRON WORKS CORPORATION

APPLETON, WISCONSIN

a subsidiary of Allis-Chalmers Manufacturing Company

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington

Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850, Station "O", Montreal 9, Quebec

VALLEY

STRICTLY PERSONAL . . .

starts on p. 108 . . . of PIMA has entered into agreement with the University of Alabama to provide a $300 annual scholarship to a junior student in "good standing enrolled in the School of Chemistry pursuing a course in Pulp and Paper Technology." Only students in the area of PIMA's southern division are eligible.

C. H. "Cam" Niederhof, wood procurement manager of West Virginia's Charleston S.C., mill, has been named to the South Carolina State Commission of Forestry, governing body of the state's forestry agency, by Gov. Hollings. A graduate of Penn State, Mr. Niederhof is now serving as chairman of the South Carolina Forestry Study Committee and is a member of Forest Industries Committee of South Carolina, Foresters' Council of South Carolina and is a former president of the Southern Pulpwood Conservation Assn . . .

Homer L. Humble has been named asst. manager of industrial relations for the Southern Kraft Div. of International Paper Co. at Mobile, Ala. A former vice president of the Brotherhood of Pulp, Sulphite and Paper Mill Workers, he has served in the industrial relations departments of several large industrial concerns . . . International Paper Co. has also consolidated its southern and central wood preserving districts. They will be known as the Eastern district with headquarters in DeRidder, La. **C. E. Scarbrough,** formerly manager of the Southern District will be mgr. of the new district. **C. M. McGregor** becomes asst. mgr. and **R. J. Butler,** former Central District Mgr., will continue on as special assistant until his forthcoming retirement.

Leonard L. Lyle is sales rep. for American Potash & Chem., Shreveport, La. district office, serving under **Niven D. Morgan Jr.,** dist. sales mgr.

E. J. Cook has joined the staff of American Cyanamid's Dyes department and will reside in Charlotte, N.C., after a brief period of indoctrination. He has 13 years of experience in paper industry.

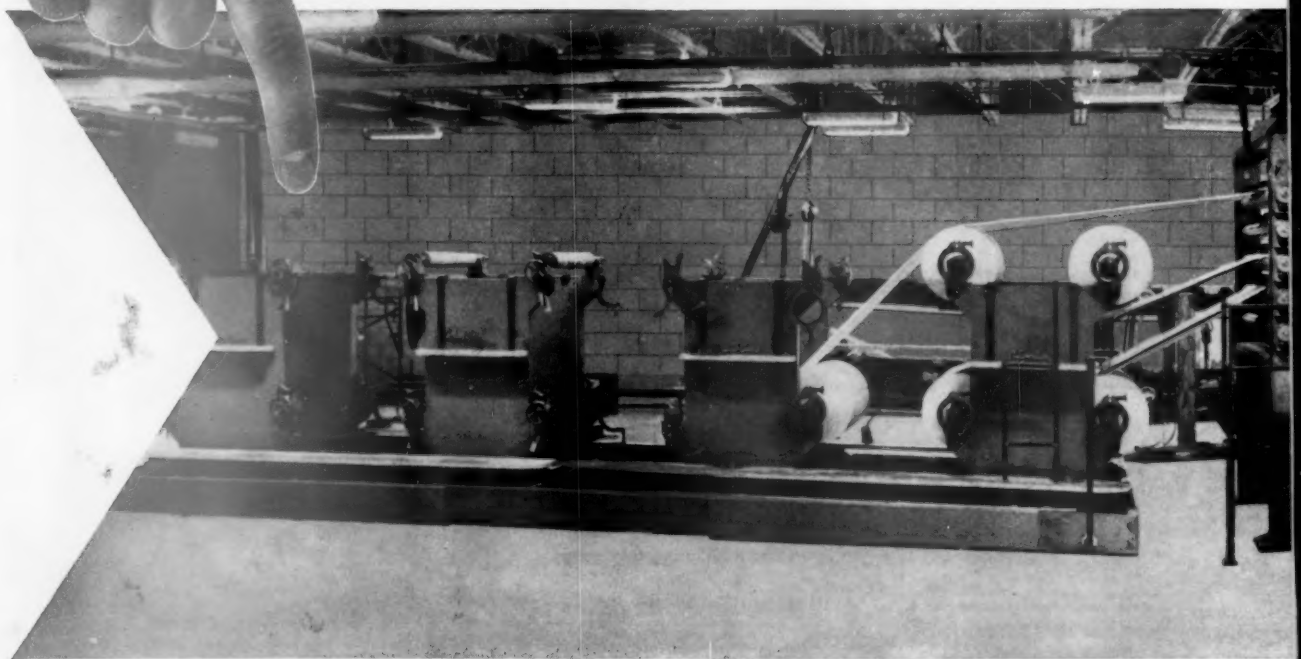
Pacific

Edward M. Forhan is appointed asst. treasurer, Alaska Lumber & Pulp Co. He will continue to perform functions of controller position based in Seattle, Wash. office.

E. J. "Eddie" Cavanaugh, general supt. of Fibreboard's 3-machine San Joaquin division, is first chairman of newest PIMA division — the Southwestern — which draws most members from California.

Weyerhaeuser Co. promotes key personnel in pulp & paperboard div. at Longview, Wash.: **T. W. Stewart,** supt. of power since 1947, to newly created position of maintenance & engineering mgr.; **Wm. M. Nanney,** who became asst. supt. of power in 1956, was named to Mr. Stewart's previous position; **Edward Koeppen** becomes asst. supt. of power; **Richard H. Cordingly,** who joined Weyerhaeuser 3 yrs. ago following graduation from Institute of Paper Chemistry,

Our Clark-Aiken Type "C" Sheeter .



becomes asst. tech. dir.-paperboard; **Harry A. Brown** and **Edward Karnoski** were named asst. paper mill superintendents.

Welton

Mitchell

Join Alaska Lumber & Pulp Co.

Ralph C. Welton, group leader of Eastern Research Div. of Rayonier Inc. at Whippany, N.J. since 1957, becomes asst. tech. dir. of ALP under **Leslie K. Bickell,** tech. director. **William E. Mitchell,** previously doing accounting work for Lockheed, is appointed chief accountant.

Robert V. Gunther becomes exec. vice pres.-gen. mgr. of Southwestern Engineering Co., Los Angeles, according to **Robert P. Miller,** president. Mr. Gunther, associated with the firm since 1942, took active part in early development of the SWECO separator manufactured by Vibro-Equipment Division. Prior to this recent promotion he was vice pres.-gen. mgr. of Southwestern's engineering-construction division. . . .

Pulpwood

Hector Matheson is promoted from construction foreman to camp supt. at Scott Paper Co's. Hamilton (Wash.) logging operations . . . **Robert L. DeLong,** asst. to director of forestry, St. Regis Paper Co., Tacoma, Wash., renamed chmn. of Wash. committee of Amer. Forest Products Industries . . . **Boyd L. Rasmussen,** deputy asst. chief, U.S. Forest Service, Washington, D.C., was appointed regional forester of Northern Rocky Mountain Region, USFS, Missoula, Mont., succeeding **Charles L. Tebbe** who retired effective Mar. 31 . . .

Forest Products Seminar In Seattle Hears Briggs

Ben T. Briggs, consultant and former research manager of Rayonier Inc., listed current problems of the pulp and paper industry at a recent seminar of the new Institute of Forest Products, University of Washington, Seattle. Problems he specified are: Wood utilization and land usage; by-products; pollution, and competition from within and from outside the industry.

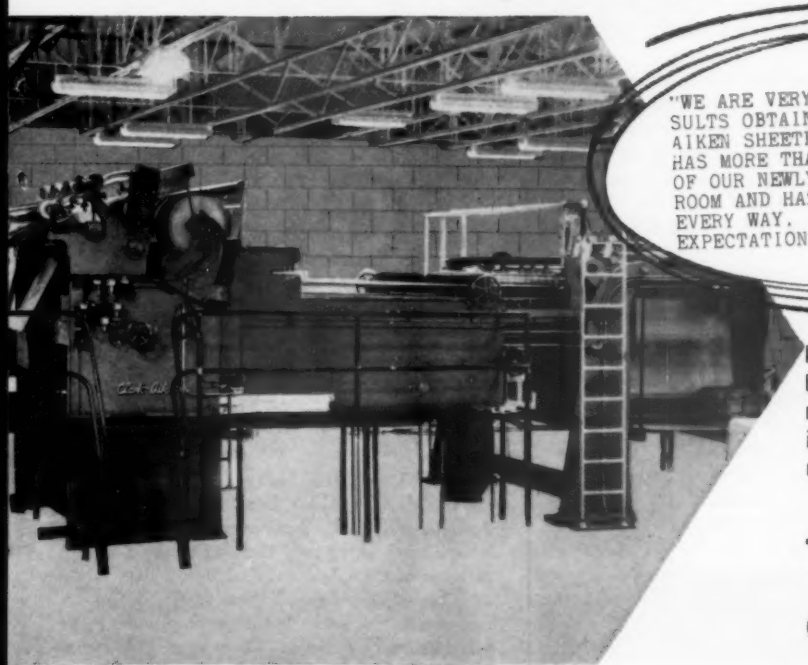
COMPLETE SERVICE

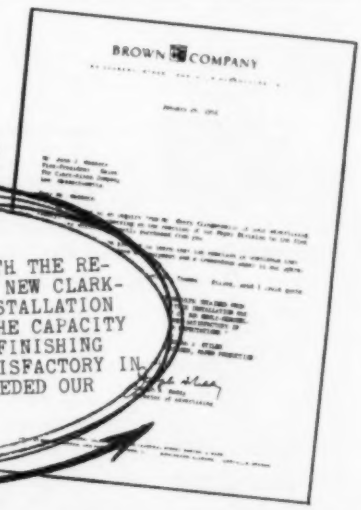
- Design
- Construction
- Maintenance

LININGS AND TILE TANKS

STEBBINS
ENGINEERING AND MANUFACTURING CO.
Watertown, N. Y.
PENSACOLA, SEATTLE, MONTREAL, VANCOUVER

. "Has exceeded all expectations," says . . .




BROWN COMPANY
"WE ARE VERY PLEASED WITH THE RESULTS OBTAINED FROM OUR NEW CLARK-AIKEN SHEETER THIS INSTALLATION HAS MORE THAN DOUBLED THE CAPACITY OF OUR NEWLY-REMODELED FINISHING ROOM AND HAS PROVED SATISFACTORY IN EVERY WAY. IT HAS EXCEEDED OUR EXPECTATIONS "

For a complete presentation of how Clark-Aiken can help you plan increased finishing room production with reduced costs, write or phone us today. You'll find interested cooperation and immediate attention to your requirements.

The Clark-Aiken Company
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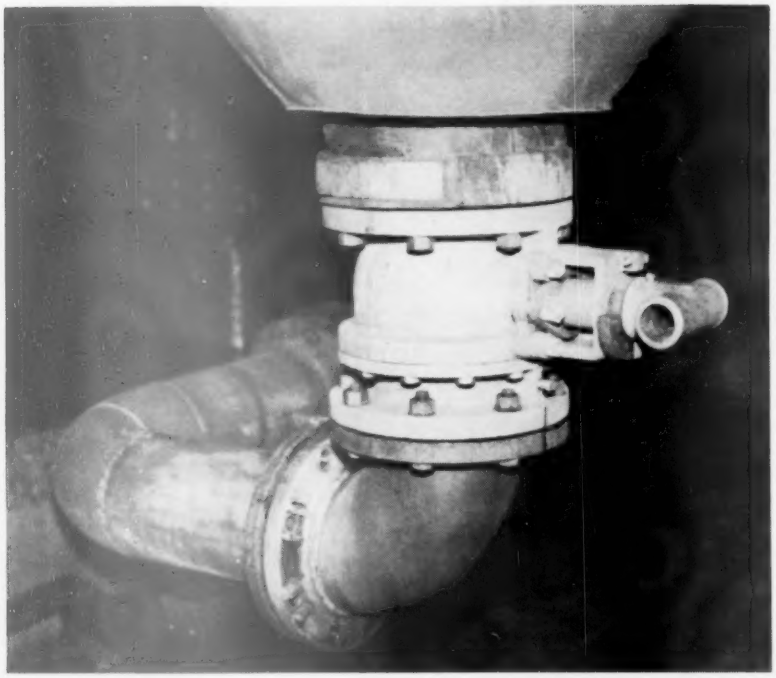
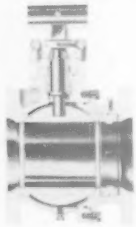
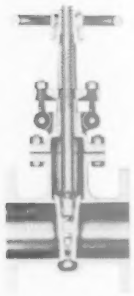
Canadian Representative: GORDON W. KEATES
133 Flora Drive, Scarborough, Ontario



PACIFIC BALL VALVES
installed on rotary digesters...





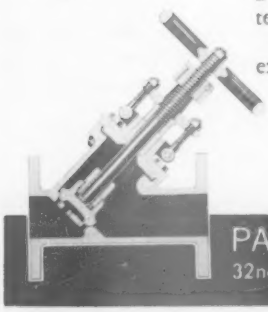
The Ball Valve shown above was installed at the Crown Zellerbach Kraft Pulp Mill in St. Helens, Oregon, on a rotary digester as a blow down valve. Satisfactory performance is being experienced in this corrosive service under cooking conditions of 350°f., 120 to 125 p.s.i. The body material of the valve was a controlled, enriched alloy, especially compounded for the paper and pulp industry; the seal material was Kel-F.

PACIFIC Ball Valves are well suited for handled abrasive slurries or suspended semi-solids because of their straight-thru, round, flow pattern—with seals protected from the flow. The quick-quarter turn action lends itself to economical pneumatic valve actuators. PACIFIC offers the widest range of standard body and seal materials...materials to cope with nearly every corrosive problem.

PACIFIC standard line of *corrosive resistant* valves are widely accepted in the paper industry. Two very popular models are shown at the left: Fig. No. 8550, a split-wedge gate valve, and Fig No. 700Y, a "Y" patterned globe valve.

Why not take advantage of PACIFIC's broad valve experience in the paper and pulp industry?

Write today for a sales representative or PACIFIC's Corrosion Resistant Valve Catalog SS-102 and PACIFIC's new Ball Valve Catalog BV-60.



PACIFIC VALVES, INC.
32nd and Walnut, Long Beach 7, Calif.

Strictly Personal . . .

Canada

Smith

Van Praag

James E. Smith, sales mgr., Albany Felt Co. has been named vice pres. and gen. mgr. of Albany Felt Co. of Canada Ltd. **Samuel Van Praag** moves up as sales mgr. for felts made in the U.S.

J. E. Carbonneau has been named comptroller of Gaspesia Sulphite Co. at Chandler, Que., according to announcement of **E. L. Neal,** pres. and gen. mgr.

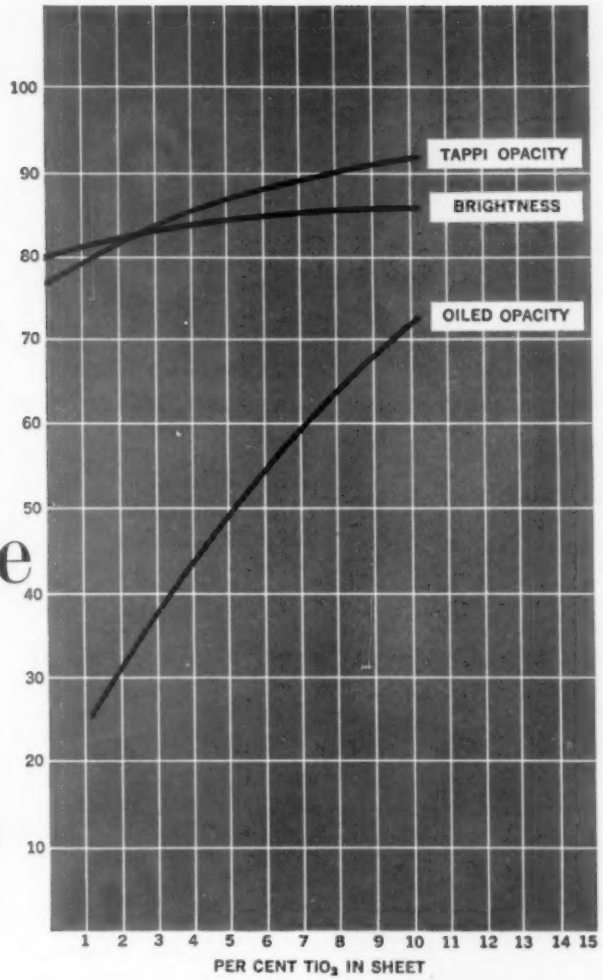
J. G. Langley has been appointed assistant mill mgr., Cornwall division, Howard Smith Paper Mills. He was formerly mill engineer of Donnacona Paper Co. in Donnacona, Que.

A. R. Chadsey has been appointed mgr. marketing servcies and **Dr. F. O. Whipple,** mgr. technical services, Crown Zellerbach Canada, in line with the company's stepped up marketing and research program. Mr. Chadsey has been associated with the building materials field for many years and was mgr. advertising and market research for the company prior to his promotion. He will be responsible for market research, marketing programs, sales training, advertising and customer service. Dr. Whipple, a graduate of Oregon State College, has an extensive background in research both in pulp and paper and wood products. He will work on new wood product design.

L. Stewart McGill is director of administration, Columbia Cellulose Co., Vancouver. Since mid-1959 admin. asst. to pulp mill mgr., Celgar Ltd., he has had 15 years industry experience.

H. R. MacMillan, honorary chairman of the board, MacMillan, Bloedel & Powell River, Ltd., Vancouver, B.C., has been named as the only British Columbia member of Canada's National Productivity Council, a new policy-making body whose chief objective is to "develop and maintain in the various . . . turn to p. 118

an outstanding titanium dioxide pigment made specifically for YOU



UNITANE® 0-120 This new pigment has been developed especially for the paper industry to give maximum retention. Designed specifically for wet-end additions, it has the same high brightness and opacity as the other well-known grades of UNITANE, and in tests with chlorinated starch has repeatedly given higher retention than any other titanium dioxide tested. These excellent properties are easily translated into savings for you—maximum opacity with minimum white water losses, high brightness with minimum show-through at lower basis weight, and good printed opacity. The curves illustrate the brightness, TAPPI opacity and oiled opacity obtained with UNITANE 0-120 at various concentrations of TiO_2 in the sheet.

A comprehensive report on the application of UNITANE 0-120 is available through your Cyanamid Pigments representative. Contact him today or write

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Lighter WHITER AND BRIGHTER WITH UNITANE

REVOLUTIONARY • PROVEN
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DRAPLEX Felts

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MADE ONLY BY
DRAPER BROTHERS COMPANY
CANTON, MASS.

Hard-Surface with Colmonoy No. 6

Increase cable conveyor button life 10 times!

Hard-surface cable buttons with Colmonoy No. 6 coated rods, they'll last up to ten times longer. Colmonoy No. 6 deposits have a low coefficient of friction, save wear on opposite surfaces as well.

You can use Colmonoy hard-surfacing alloys on chipper disc wear plates, bed knives, and pump parts too.

Write today for the Colmonoy Hard-Facing Manual and Engineering Data Sheet No. 47, on how to protect cable buttons.

HARD-SURFACING
A BRAZING ALLOYS

WALL COLMONOY
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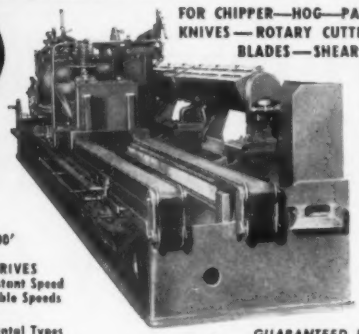
HANCHETT KNIFE GRINDERS

FOR CHIPPER—HOG—PAPER—VENEER KNIVES — ROTARY CUTTERS — DOCTOR BLADES — SHEAR BLADES, ETC

MODEL AK AUTOMATIC

EXTRA HEAVY DUTY Traveling Wheel Type
Capacity— 84" to 396"
Motors— 7½ to 40 HP
Speeds—10' to 100' and faster
TRANSMISSION DRIVES
Mechanical—Constant Speed
Hydraulic—Variable Speeds
WHEELS
Cylinder or Segmental Types
16 — 20 — 24" Diameter



1. Guaranteed Construction
2. Finest Materials
3. Advanced Design
4. Quiet, Smooth Running and Entirely
5. Free of Shock or Vibration

GUARANTEED PERFORMANCE
REAL WORK HORSES

We Guarantee our Machines to Deliver the Maximum in Precision Ground Knives per Hour with the Finest and Sharpest Edges for Longer and Better Cutting Action

MODEL GK AUTOMATIC

HEAVY DUTY Traveling Table Type
Capacity — 32" to 196"
Motors — 5 - 7½ - 10 - 15 HP
Table Speeds — Hydraulic (10' to 80' per min.); Mechanical (Constant)
Gears — Hardened
Bearings — Ball and Roller Types
OTHER MODELS
MODEL "DN" — For normal knife requirements — Sizes — 32" to 108"; Motors — 3 - 5 HP; Wheels — 10" to 14" Diameter — also Straight Wheel and Circular Knife Grinders

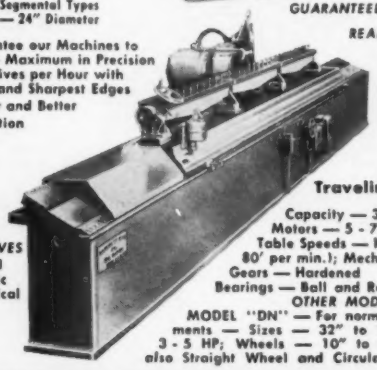


TABLE DRIVES
Mechanical
Hydraulic
Electrical

HANCHETT MANUFACTURING COMPANY
Main Plant
BIG RAPIDS, MICHIGAN
West Coast
PORTLAND 1, OREGON

SULPHITE MILL ACID PLANTS
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GAS COOLERS—SURFACE AND SPRAY TYPE
JENSSEN TWO TOWER ACID SYSTEMS
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COMPLETE DESIGN AND INSTALLATION

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MASSENA, NEW YORK

Western Representative:
James Brinkley Co., 417-8th Ave. So., Seattle, Wash.
FOUNDED 1915

PULP & PAPER MILL PUMPS

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NATIONAL PVC PIPE
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PEERLESS
WALWORTH PVC FITTINGS

WADE

R.M. WADE & CO.
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Production & Management Magazine of the Industry

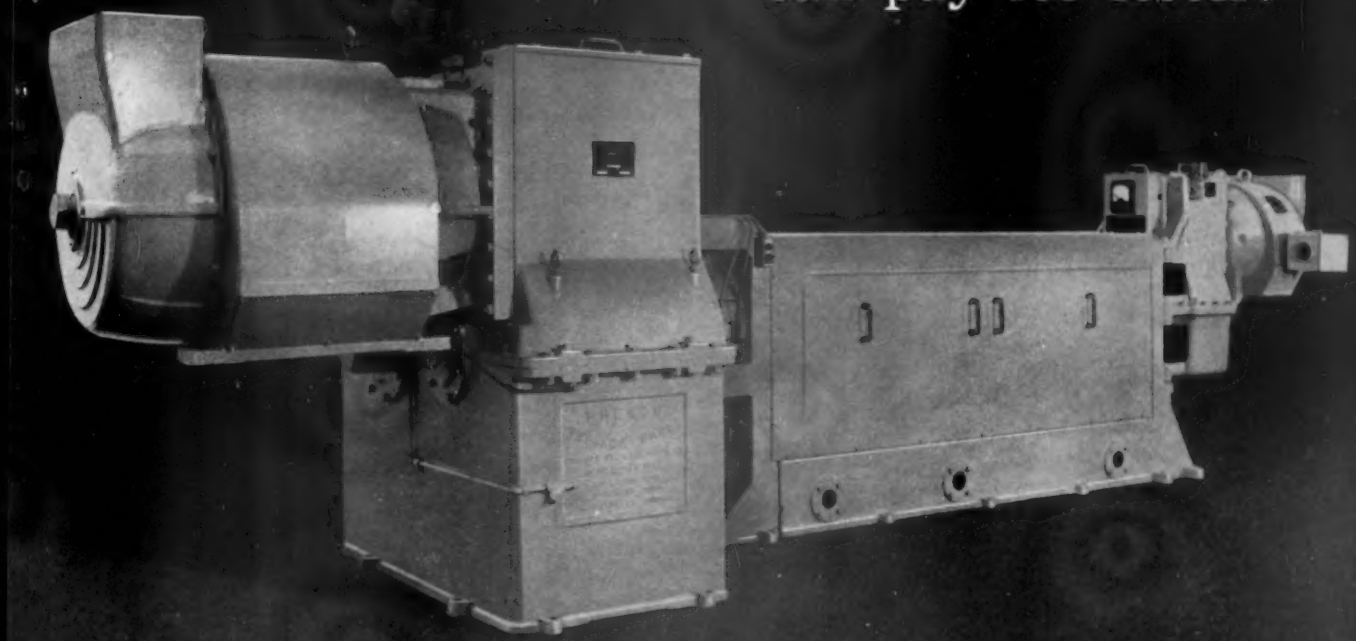
PULP & PAPER

Largest Paid Circulation in U.S.

Fastest Growing Magazine in the Industry

PROFIT STORY:

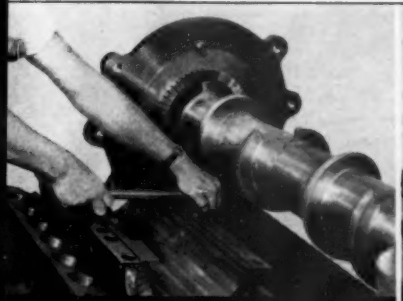
New FRENCH press can pay for itself!



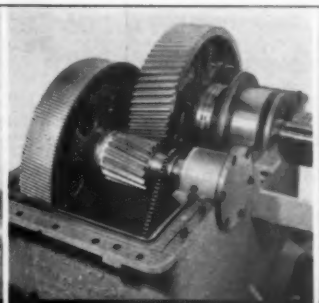
Economical 2-stage continuous screw press uses less power, achieves greater chemical recovery and increases machine production

You use less power, because *one* French 2-stage press attains the same washing efficiency as two single stage presses arranged in series, and requires substantially less power. The French 77" barrel, with water injected midway, delivers up to 90% chemical recovery in a single pass. Added benefits are a thoroughly fiberized high quality pulp that usually requires less total refining power and often makes possible increased paper machine production. You buy *one* French 2-stage press instead of two small single stage presses for a substantial capital investment saving. Also 50% less floor space is required. Additional savings are realized because the French press is designed and built for years of trouble-free service. To discover why the new French 2-stage screw press can pay for itself, write for free Bulletin 100 entitled, "How the French 2-stage press cuts costs — increases production" to Dept. A-4.

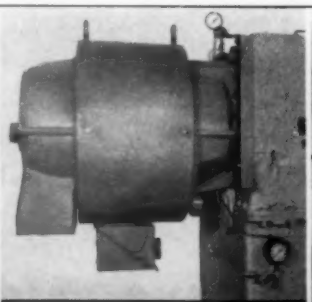
FRENCH OIL MILL MACHINERY CO.
PIQUA / OHIO
Designers and builders of machines for the Process Industries



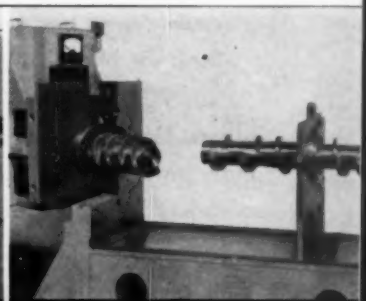
Main drain cage hinged for easy access. Cage can be furnished with inserts into which all wearing parts are assembled for quick removal and replacement.



Main drive gears have file hard surface hardened to full depth. Anti-friction roller bearings. Self-circulating lubrication.

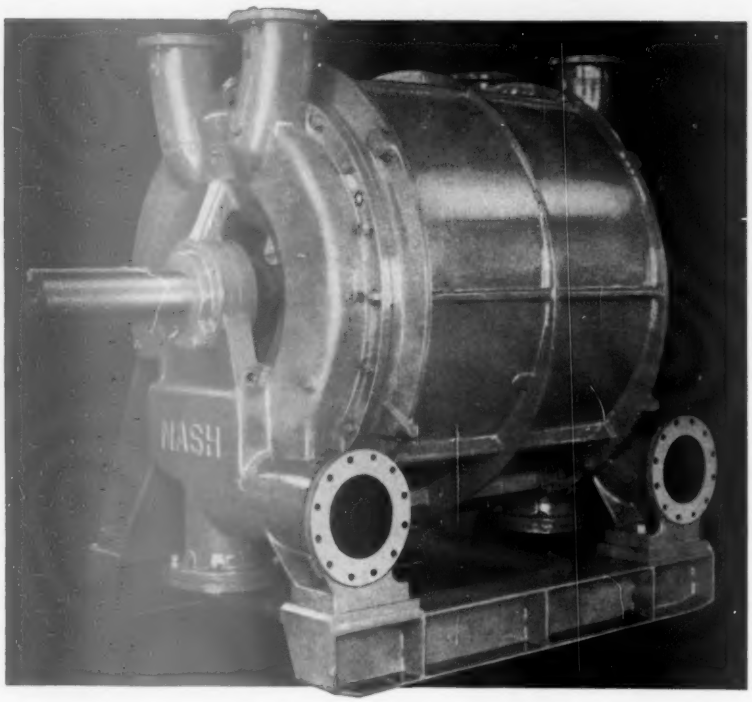


Adjustable motor mount (pat.) enables operator to change press speed quickly by loosening motor support clamps, then backing up and raising motor by jack-screw.



Feed worm unit hinged to permit easy separation of feed worm from main shaft. Permits easy removal of wearing segments.

Just 3 days lost production of a Paper machine can cost more than the vacuum pumps. That makes dependability the essential factor in pump selection. No pump is more dependable than a Nash



Over a thousand leading mills depend on Nash Vacuum Pumps to insure uninterrupted production. Nash Pumps are built to stand the pounding of continuous operation. They are simple. They have no internal parts in wearing contact. They will handle slugs of water or stock. They are designed to operate at the low speeds necessary for long life and reliability. Don't gamble with your production. Install Nash Vacuum Pumps and be safe.

The new Nash 5308-A shown above, has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

NASH ENGINEERING COMPANY

SOUTH NORWALK, CONN. U. S. A.

Strictly Personal . . .

starts on p. 114 . . . and changing circumstances of industrial life, a positive attitude of mind in industry, among both management and labor, respecting industrial efficiency."

W. H. "Bill" DeRosier is now Canadian sales mgr. for Morbark Portable Debarker Co., based at Berlin, N.H.

Suppliers

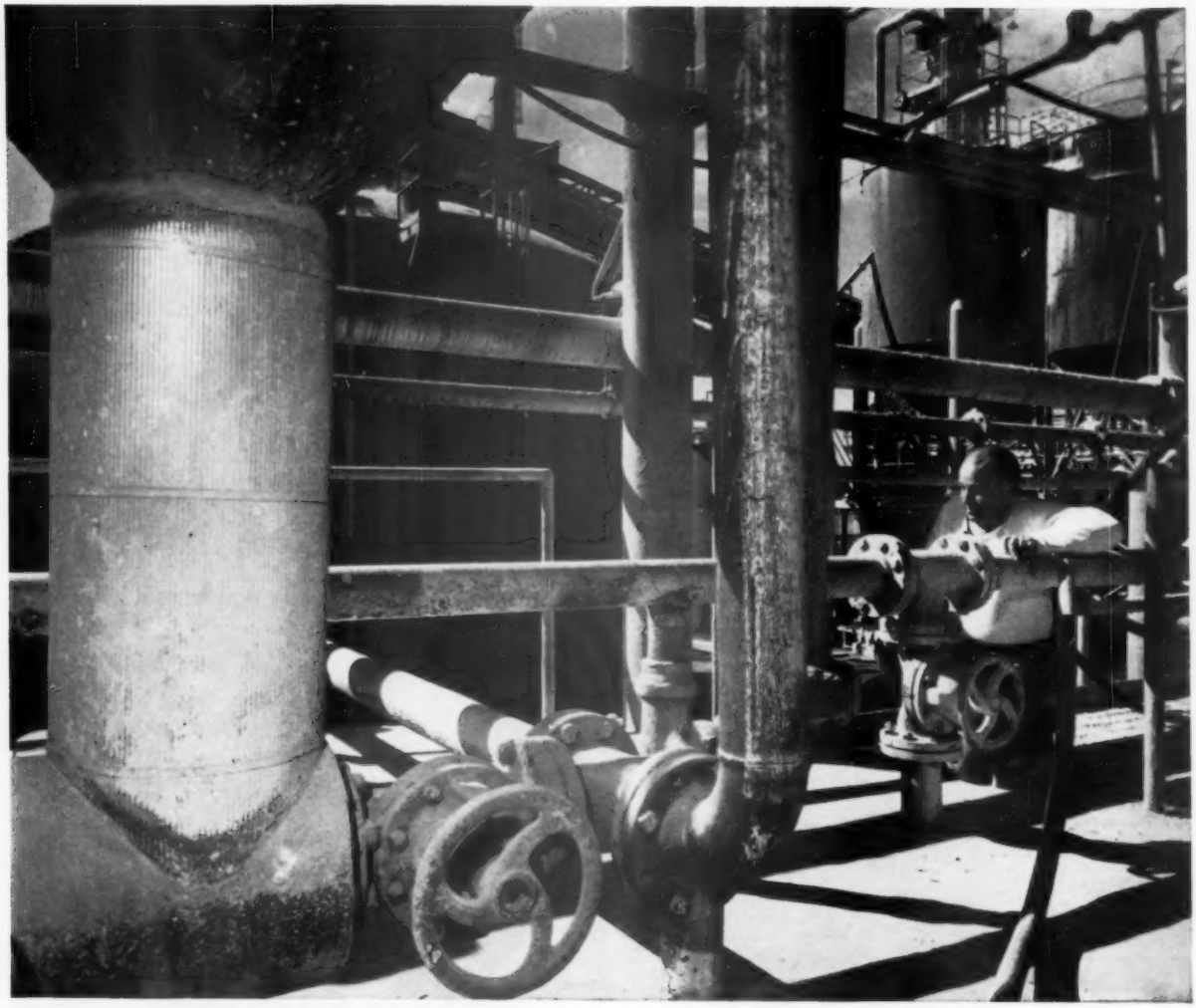
Moffitt Bryant Willers

Hooker Chemical Corp. has elected three new top executives. **Thomas E. Moffitt**, pres. since 1957, moves to bd. chmn. and chief executive officer. **F. Leonard Bryant** is new pres., promoted from exec. v. p. **Thomas F. Willers** moves up from v. p. to exec. v. p.

Mr. Moffitt joined Hooker in 1930 as a salesman in Tacoma, Wash. Except for 5-yr. absence, he has been with Hooker ever since, and since 1957 had been president. Mr. Bryant, Dartmouth chem. grad., has been with Hooker since 1935, serving at various works and as v. p.—prod. and as head of research, marketing and development. He has been exec. v. p. since last Sept. As v. p. since 1957, Mr. Willers has been in charge of four divisions, engineering and industrial relations. He started in 1941 as cost analyst.

Turner Watts

Appleton Woolen Mills, Appleton, Wis., has established a Products Services dept. **Claire Turner**, former sales mgr., becomes director. He is succeeded as sales mgr. by **Ralph C. Watts**, previously district sales mgr. of UARCO Inc., Chicago. Mr. Turner is a 35-year veteran in the paper and paper clothing industries and had been Appleton Woolen sales mgr. since 1955. Prior to entering the felt field he had served as mgr. of several paper mills in New York and New England.



Bowaters Southern Paper Corporation, Calhoun, Tennessee

SARAN LINED PIPE carries highly reactive chemicals for six years, with only minor repairs!

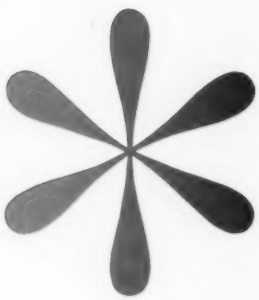
Here, Saran Lined Pipe carries thousands of gallons a day of extremely corrosive paper-making chemicals . . . calcium hypochlorite solution, wet chlorine gas, acids . . . at pressures up to 150 psig. Nearly a mile of Saran Lined Pipe has served Bowaters Southern Paper Corporation since 1954, with only minor repairs needed.

Bowaters reports that Saran Lined Pipe has greatly reduced piping problems in transporting highly reactive pulping chemicals over long distances, under high pressures. For example, the Saran Lined Pipe that carries scale-forming materials, such as calcium hypochlorite, can be acid-cleaned when necessary—an operation not always possible with other kinds of pipe.

Because this pipe's tough steel casing is strong and self-supporting, long pipe runs require only normal support. And plant crews estimate they can cut, thread and fit Saran Lined Pipe in less time than required for other types of corrosion-resistant piping.

Wherever operations require strong, corrosion-resistant piping—no matter how corrosive the cargo may be—consider Saran Lined Pipe. Saran Lined Pipe, fittings, valves, and pumps are available for systems operating from vacuum to 300 psi, from below zero to 200° F. They can be cut, fitted and modified easily in the field without special equipment. For more information, write Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale, Mich., Dept. 1570JJ5-1.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

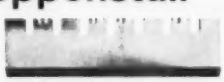


Paper... is improved by Beckman continuous pH control instruments.

In efficient modern mills for production of paper, pH measurement and control play a vital role. Continuous process pH equipment controls paper machine furnish, influencing final paper quality... reduces excess use of alum, saving on chemicals... saves manpower required for periodic laboratory analyses. Reliable Beckman pH instruments save time and money also in water treatment, bleaching, white water clarifiers, digester condensate, digester pH and sulfur dioxide treatment. In addition, Beckman ORP instrumentation controls bleach preparation, chlorination, and destruction. For application information write for Data File 62-5-06.

Beckman
Scientific and Process Instruments Division
Beckman Instruments, Inc.
2500 Fullerton Road, Fullerton, California

Uniform Chips with longer lasting Heppenstall chipper knives



Heppenstall has the exact knives for your chipper. Exact because they give you uniform chips, cord after cord—help you keep cooking time consistent for every batch. Exact because Heppenstall chipper knives last longer, keep costly down time to a minimum.

For more specific information, contact your Heppenstall representative or write us direct.

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CHEMICAL USERS' GUIDE

To General Chemical Products for the Paper Industry

Product	Available Forms	Commercial Strengths	Shipping Containers	Applications
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free: Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + Water *(Liquid Alum)*	Commercial & Iron Free: Liquid	36.5° Be (8.3% Al_2O_3)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4 *(Sodium Sulfate)*	White or Grayish Granules	99.5% Na_2SO_4 95% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Sulfuric Acid H_2SO_4 + Water	Liquid	66° Be (93.2% H_2SO_4)	Carboys Drums Tank Trucks Tank Cars	Wire souring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps.
Sodium Thiosulfate, Crystal $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo)*	Colorless Crystals	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Fibre Drums	Anti-chlor.
Sodium Thiosulfate, Anhyd. $Na_2S_2O_3$ *(Hypo)*	White Granules	98% $Na_2S_2O_3$	Bags Fibre Drums	Anti-chlor.
Sodium Sulfite, Anhyd. Na_2SO_3 *("Sulfite")*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + Water	Liquid	38° to 60° Be Various ratios of Na_2O to SiO_2	Drums Tank Trucks Tank Cars	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper. Aid in bleaching & flocculation.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + Water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Drums Tank Trucks	Used with chlorine to form chloramines for slime control. Biological sludge systems nutrient.
Sodium Fluoride	White Powder	98% NaF	Bags Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhyd. $Na_4P_2O_7$ *(Pyro)*	White Powder	52.1% P_2O_5	Bags Fibre Drums	Felt washing; pitch dispersion.
Sodium Tripolyphosphate $Na_5P_3O_{10}$ *(Tripoly)*	White Powder	56% P_2O_5	Bags Fibre Drums	Felt washing; pitch dispersion.
Nitric Acid HNO_3 + Water	Liquid	42° Be (67.2% HNO_3)	Carboys Drums Tank Trucks Tank Cars	Nitrating pulp; cleaning monel metal.
Phosphoric Acid, Com'l. H_3PO_4	Liquid	75% H_3PO_4 (54% P_2O_5)	Tank Cars	Nutrient in biological sludge systems.
Hydrochloric Acid *(Muriatic Acid)*	Liquid	18°, 20°, 22° Be (27.4% to 34.1% HCl)	Carboys Drums Tank Trucks Tank Cars	Cleaning machinery.

The products advertised are commercial chemicals having various uses, some of which may be covered by patents, and the user must accept full responsibility for compliance therewith.

OTHER PRODUCTS: Sodium Metasilicate; Trisodium Phosphate; Copper Sulphate; Disodium Phosphate; Sodium Bisulfite.

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Check the features listed below, then add to them the fact that LimiTorque is not only the Pioneer Valve Operator, but is by far the most widely used in the World . . . and you have the answers to the question: **Why LimiTorque?** . . . after all "nothing succeeds like success."

For full details on every type and size of LimiTorque, Contact your Valve Manufacturer, or your nearest LimiTorque Sales-Engineering Office.

- Micrometer torque seating switch gives tight valve closure, and protects valve parts from damage.
- 8 to 16 contacts available on Geared Limit Switch for Limits — Indicating Lights — Interlocking — Auxiliary Controls.
- Self contained unit—no gears, stem nut or bearing to buy
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- Hammerblow device . . . allows motor to reach full speed, before load is engaged.
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- Reversing contactor — Pushbuttons — Indicating Lights—available Integral In Unit.
- High torque motors.
- Simple valve yoke.
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- Actuation may be any available power source such as electricity, air, oil, gas, water or steam.
- LimiTorque is designed for any type and size plug, butterfly, gate and globe valves. Entire unit can be lifted off valve yoke, by removing flange bolts.

Send for LimiTorque Bulletin #1-60, and please use your Business letterhead when requesting.

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New production Waterbury felts on the way to save a mill money

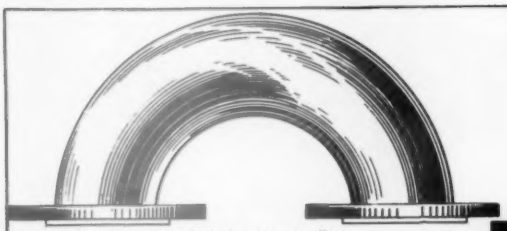
What you see here is the progeny of one of our better corporate marriages on the way to help some fine paper mill keep quality *up* and costs *down.*

They are still Waterbury felts, loomed in the well-known Waterbury mill in Skaneateles Falls, N. Y. The difference is that like all *new production* Waterbury felts, they now benefit from the vast technical skills of the Porritts & Spencer group, largest producers of papermakers' felts in the world.

Many mills have discovered for themselves how superior these *new production* Waterbury felts are. If you are curious to know whether they can also help you, please phone or write us.

THE WATERBURY FELT CO., INC. Skaneateles Falls, N.Y.

Member **PORRITTS & SPENCER** Group



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FELKERWELD *for Endurance.* Our more than 40 years' experience in fabricating plain steel, applied to stainless steel when it came into the market enabled us to develop our FELKERWELD PROCESS for ENDURANCE, with such metals as Stainless Steel, Stainless Clad Steel, Inconel, Monel, Nickel, Copper and Aluminum Bronze. FELKERWELD is your guarantee for quality and workmanship.

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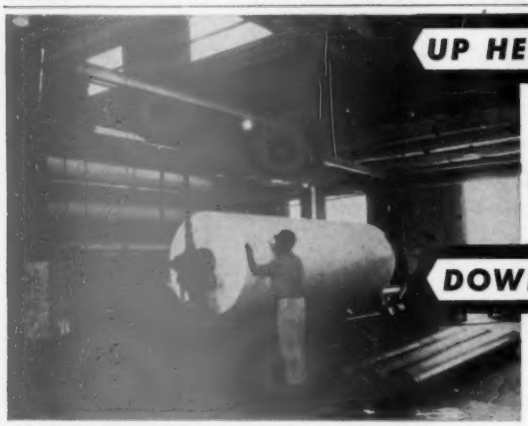
MARSHFIELD, WISCONSIN



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Placing Cores on the Paper Winder

DOWN HERE

This essential paper mill operation is made easier and accomplished quicker with the aid of a precision control Euclid Crane.

Directly behind the large sheet roll of paper are three more cores ready for placement on the winder.

Paper mill cranes are a specialty of ours. We can build them to meet your general or specific handling needs. For stand-by or continuous service. Any capacity, any control system.

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for details write THE EUCLID CRANE & HOIST CO.
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The last word

"The Waste Makers"— History—but Not Current

Whether there will be enough wood fibers to supply America's needs in the future receives passing concern in Vance Packard's latest best-selling book, *The Waste Makers.*

Millions of readers have learned from Mr. Packard that each man, woman, and child in the country consumes nearly a ton of wood products a year, that resultantly the nation's stand of saw-timber has shrunk by nearly one-half since Teddy Roosevelt's day, and that the real price of forest products—corrected for inflation—has doubled in the last six decades.

In mellower vein, sociologist Packard points out that "some of the major timber companies such as Weyerhaeuser have finally taken action to work out a 'perpetual yield' for their timberlands." For the exceptional mention and for the spotlight on the nation's important forest resources, thanks are due to Mr. Packard.

There are few who deal with forest resources today, however, who will share the author's implied concern for the future. The latest *Timber Resources Review* of the U. S. Forest Service shows that for the first time America is growing trees as fast or faster than they are being cut. Tremendous advances in forest conservation and fiber utilization assure a matching supply with foreseeable demands.

A number of decades ago, the subject of forest conservation may have been a proper one for discussion in a book with the title of *The Waste Makers.* Today there is no place for waste in the nation's timber industry. Indeed, Mr. Packard's point concerning the doubled price of timber products in the last 60 years makes waste of wood fibers foolish.

The same law of economics applies to a comparison of America's renewable and non-renewable resources. Trees are being continually replaced. This is why the price of forest products has merely doubled since 1900, while the prices of comparable products made out of non-renewable materials—steel, bricks, and concrete blocks among them—have zoomed much higher.

The price of Mr. Packard's book—corrected for inflation—is perhaps three or four times more than it would have been at the turn of the century. It is, nevertheless, an interesting reminder to Americans that we must cherish and wisely use our resources.—*Weyerhaeuser News.*

Safety Award for PULP & PAPER "For Exceptional Service"

Howard Pyle, president of the National Safety Council, announces in a letter to William B. Freeman, president, Miller Freeman Publications, that PULP & PAPER is winner of its Public Interest Award.

This award for 1960—"for exceptional service to safety"—went to one other magazine in the paper industry, *Pulp & Paper Magazine of Canada,* and also to *The Timberman,* another Miller Freeman publication. In all, the award went to 76 magazines, of which 19 are in the general circulation field. This, of course, is only a tiny fraction of all magazines published.

The entire staff of PULP & PAPER is proud of this recognition but even more than this, it is happy if it contributed even in a small way, to saving lives or preventing injuries in the mills.

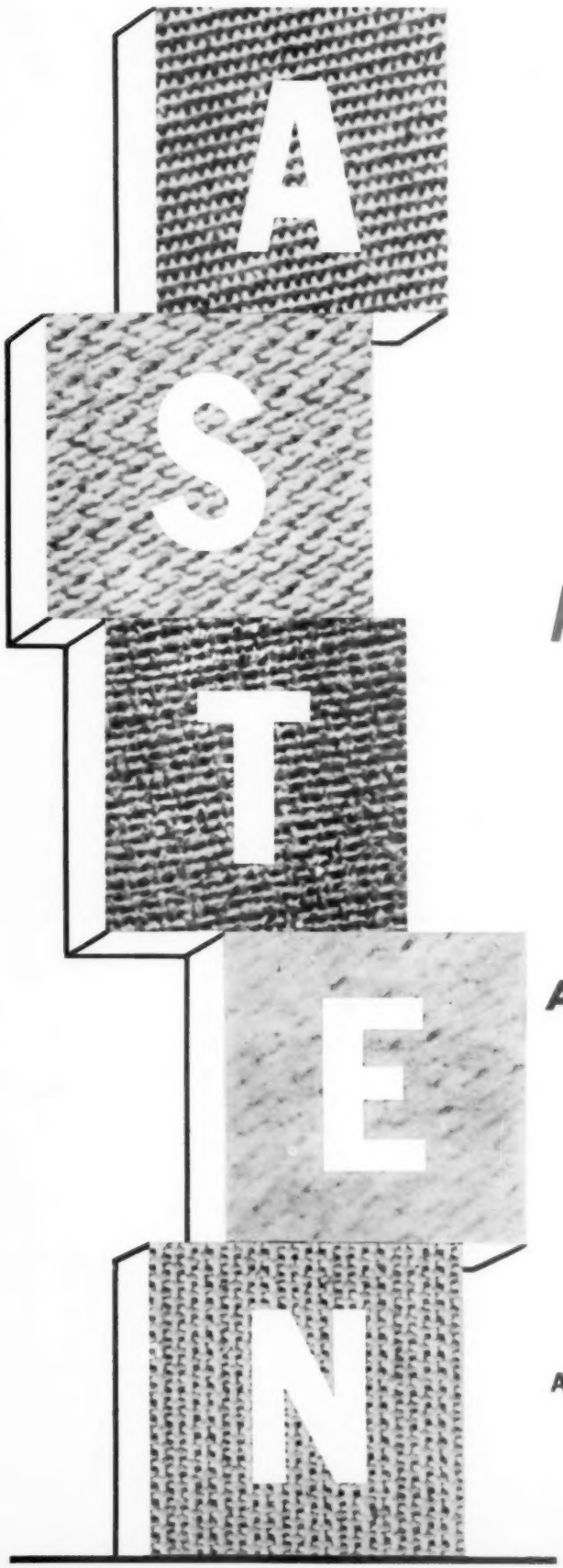
Mr. Pyle's letter to Mr. Freeman follows:

"It is my pleasure to inform you that the National Safety Council's Public Interest Award has been granted to PULP & PAPER.

"We here at the Council know all you have been doing for safety, and we are delighted that the judges agreed.

"I am sure you feel, as we do, that there is another dividend as a result of your safety efforts—the knowledge that you have helped prevent many accidents.

"Many thanks for your support. Your Public Interest Award plaque will be coming to you in the next few weeks."



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